

## **SILVER KILLS VIRUSES, STUDY FINDS**

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In a groundbreaking study, the Journal of Nanotechnology has published a study that found silver nanoparticles kills HIV-1 and is likely to kill virtually any other virus. The study, which was conducted by the University of Texas and Mexico University, is the first medical study to ever explore the benefits of silver nanoparticles, according to Physorg.

During the study, researchers used three different methods of limiting the size of the silver nanoparticles by using capping agents. The capping agents were foamy carbon, poly (PVP), and bovine serum albumin (BSA). The particles ranged in size from 1 to 10 nanometers depending on the method of capping. After incubating the HIV-1 virus at 37 C, the silver particles killed 100% of the virus within 3 hours for all three methods. The scientists believe that the silver particles bonded through glycoprotein knobs on the virus with spacing of about 22 nanometers in length.

While further research is needed, researchers are optimistic that nanological silver may be the silver bullet to kill viruses. The researchers in the study said that they had already begin experiments using silver nanoparticles to kill what is known as the super bug (Methicillin resistant staphylococcus aureus). Already used as a topical antibiotic in the medical industry, silver may now come under consideration as an alternative to drugs when it comes to fighting previously untreatable viruses such as the Tamiflu resistant avian flu.

Staff Reports - Free-Market News Network

## **Silver Helps Regrow Human Tissue — Physician Patents Technique Using Silver Ions**

The Silver Institute, Washington DC  
July 27, 1999

Washington, D.C. — Silver, the same commodity used in coins and in the manufacture of jewelry, silverware, mirrors and electronics, helps regenerate human cells that have been destroyed by disease or damaged in accidents, according to a recently released report in this month's edition of Silver News, a bi-monthly newsletter published by The Silver Institute.

Clinical tests indicate that the silver-based procedure is so successful that one patient who had sustained three crushed fingers in an accident grew new tissue rapidly. Within 2-1/2 months, skin coverage was complete and there was normal full sensation, good blood supply and all joints had a normal range of motion. If left untreated, the 30-year old electrician's fingers would have fallen off after turning black from gangrene, and he would have been left with a totally useless hand. Ironically, his orthopedic surgeon recommended amputation of all three fingers, but the patient requested silver-ion therapy which proved successful.

The mechanism by which silver ions help rebuild tissue has been studied for more than a decade by Dr. Robert Becker of Becker Biomagnetics in New York. Dr. Becker initially reported his findings at the First International Conference on Silver and Gold in Medicine, co-sponsored by The Silver Institute in 1987. In the decade since, this technique has been used in clinical settings where hundreds of patients with various wounds have recovered. In addition, a laboratory study conducted by the U.S. Army Institute for Surgical Research in Houston, Texas, showed that laboratory animals with burn wounds treated under controlled conditions experienced shortened time for reconstruction with silver-nylon dressings. Recovery of skin function was faster when electric current was applied compared to no application of electric current. Last fall, Dr. Becker received a U.S. patent (5,814,094) for the devices, materials, and techniques involved in regeneration of tissue using silver ions.

After several hundred cases, Dr. Becker believes that the technique works in three stages. The first stage is the chemical combination of highly active free silver ions with all bacteria or fungi present in the wound which are inactivated within 20 to 30 minutes. The second stage occurs over the next few days. Silver acts on fibroblast cells to cause them to revert to their embryonic state, becoming stem cells. These cells are universal building blocks whose role is to reconstruct new tissue. In the final stage, silver ions form a

complex with the living cells in the wound area to produce immediately convertible stem cells. The end result of this conversion is that the stem cells supply all the building blocks necessary to completely restore all anatomical structures.

No other known treatment provides sufficient numbers of the embryonic or stem cells required for true regeneration of damaged or destroyed tissues in humans and animals. The success indicates that there is the potential not only for the healing of near-surface wounds, but for regenerative repair of internal organs such as the heart, liver, brain and the spinal cord.

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## Silver does more than kill bacteria

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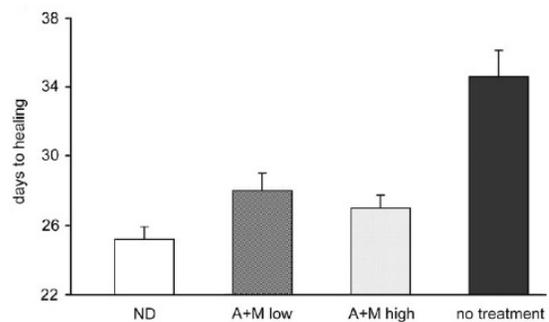
### ***Scientists in Hong Kong uncover the biological mechanism behind the age-old treatment of wounds with silver.***

Silver has for centuries been used to treat and prevent infection, and its wound-healing properties are well known. Less well understood is exactly how the metal acts as such an effective antimicrobial and healing agent. [Kenneth Wong](#) and others at the University of Hong Kong recently investigated the wound-healing properties of silver nanoparticles, and have shown that they do more than simply kill bacteria.

Wounds heal following a complex combination of blood coagulation, tissue inflammation and remodelling, and the best medical interventions are those that prevent or at least minimise scarring. Silver has long been used to treat a variety of diseases, and silver's antibacterial effect is thought to be due to its penetration of cell walls and alteration of microbial DNA.

But the new research, published in the journal [ChemMedChem](#) (subscription required), indicates that silver goes further than this and modifies cytokines – the enzymes involved in cell growth and movement – leading to reduced inflammation and an increased rate of healing.

Wong and his colleagues describe wounds treated with silver nanoparticles healing in around 25 days, whereas it takes 29 days with common antibiotics, and 35 days with wounds left untreated. This translates into considerable cost savings in medical care.



With a scale size of around 10 nanometres, Wong says that silver can be used in a pure form and made into a stable solution, and also has the advantage that with a large surface area, the dose can be reduced. "The next step is to evaluate whether there is a

receptor for silver, and what signalling pathways are affected,” says Wong.  
“Furthermore, we are going to investigate if other nano-metals or compounds can be applied in disease models such as haemostasis and tissue regeneration.”

MIT-based medical scientist Rutledge Ellis-Behnke regards the Hong Kong group’s research as groundbreaking, saying: “Silver has been used for over a thousand years in traditional Chinese medicine for wound healing, but this is the first time that a hint of the true mechanism has been shown.”