

* **to prevent**
* **Hospital-Acquired Infections**

Report on Using Products with

Silver

Nanoparticles

Proje No: 612367

  

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Occasionally there are news reports in the media about deaths due to hospital-acquired infections.

Are products with silver NP effective in preventing hospital infections?

and

What are the benefits and risks of using these products?

**Risks**

* Biochemistry researchers from Denmark report in the ACS Nano that silver as a metal does not pose any risks. However, when it is divided into pieces of nano size, between 1 and 100 nm, it becomes small enough to penetrate a cell membrane. When the silver nanoparticles penetrate the cell, changes may occur in the cell.
* In order to examine the effects of nanoparticles that are believed to enter the body by food ingestion and to penetrate cells, researchers have examined human intestine cells. They determined that silver particles of 20 nm can penetrate cells. A laboratory examination of these particles revealed that they had created free radicals in the cells they penetrated and caused damage. There had also been changes in the amounts and structures of the proteins and enzymes in the cell. We know that when the number of free radicals is excessive, they play a role in many diseases such as cancer and neurologic illnesses.

Kjeldsen, vd. ACS Nano, 2014. DOI: 10.1021/nn4050744

<http://bilimsol.org/bilimsol/biyoloji/gumus-nanoparcaciklarin-riskleri>

<http://www.riskscience.umich.edu/risk-bites-facts-silver-nanoparticles-health/> (Risk Science Center)

<http://nanoturkiye.blogspot.com.tr/2008/04/gm-nanoparacklar-aslnda-zararl-imi.html>

<http://www.sciencedaily.com/releases/2008/04/080429135502.htm>

<http://munews.missouri.edu/news-releases/2008/0429-hu-silver-nanoparticles.php>

**Fresh Water for 1 Year for 2 Dollars:**

A researcher from India developed a technique that will solve the clean water shortage problem for only 2 dollars per family per year.

In fact, it can provide a very simple solution to water shortages, one of the most serious problems in the future. An Indian researcher pointed out that silver nanoparticles can be used all over the world to obtain clean drinking water.

Thalappil Pradeep, a researcher at the Indian Technology Institute in Chennai, India, developed an aluminum-alloyed filter containing nanoparticles. As the water flows through the filter, the nanoparticles are oxidized and the filter destroys the viruses and bacteria in the water as the ions released by the nanoparticles release. At the same time, they neutralize the chemicals such as lead and arsenic in water.

Pradeep has pointed out that some nanoparticles mix with the water, but the quantity is so small that it does not pose any risks. The Indian researcher refers to the filtered water as ‘positive water’. The filter can be the most suitable solution for densely populated areas that experience water shortages. Every liter of water used to produce nanoparticles yields 500 liters of ‘Positive water’. In an experiment conducted by researchers, 50 g of alloy cleaned 1500 liters of water without any need for reactivation. Based on this result, it has been calculated that a filter of 120 g can provide clean water for a family for 1 year, and it will cost only 2 dollars.

(<http://www.yesilbilgi.org/su-sikintisina-2-dolarlik-cozum.aspx>

<http://www.scientificamerican.com/article/cheap-nanotech-filter-water/>)

**Advantages**

* In the literature, silver ions are known to be the most widely effective antimicrobial material against bactericide and germ types. Besides being highly effective against bacteria and germs, they have no harmful effects on the human body. Therefore, silver ions are the preferred coating material for artificial limbs (Altuner, 2013)
* Nano washing machines remove unpleasant odors from laundry, and they also help conserve energy, water, and detergent. Silver ions attack the cells of microorganisms, and nano silver kills bacteria. It removes bacteria, mold, and germs from clothing and prevents their regrowth for 30 days (Altuner, 2013).
* It has been scientifically proved that socks containing nanosilver have antibacterial and antimicrobial properties and therefore prevent athlete’s foot (a fungus infection). It also contributes significantly to the treatment of this condition. Nanosocks produced from pure silver thread and natural fibers allow air to reach the feet, to prevent perspiring. This fabric prevents the growth and reproduction of bacteria that cause unpleasant foot odors. The silver with its antibacterial property neutralizes perspiration (ammoniac) and denatured proteins and removes the scent molecules that form by the bacteria (Altuner, 2013, 2014; Bayındır 2009).

http://(fbd.beun.edu.tr/index.php/zkufbd/article/download/118/136)