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Silver News

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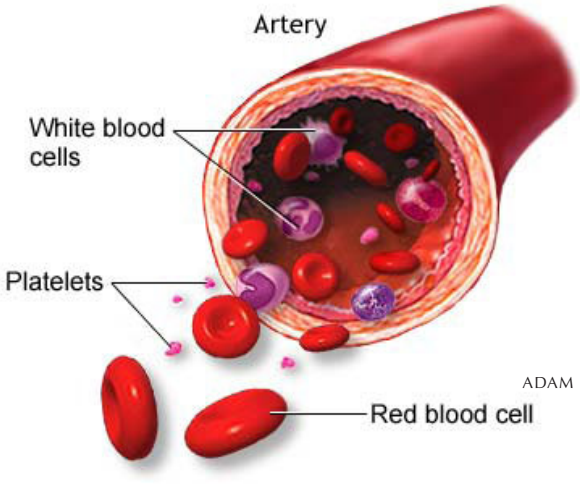
Nanosilver Overcomes Blood Platelet Disorders

By Samuel Etris, Senior Technical Consultant to The Silver Institute



Blood clotting in arteries can be life-threatening, so researchers are testing the anti-coagulant properties of silver.

When the human body sustains a wound, blood platelets stick together to help clot the blood and heal the injury. But blood clotting is not always triggered by an open wound but by a disorder in the body that can block arteries. This type of platelet aggregation is serious and can be life threatening.

For many patients, physicians prescribe anti-coagulants, but exact dosing can be a challenge. Too much of an anti-coagulant can cause blood loss either internally or through a skin wound. Too little anti-coagulant and the patient's arteries may clog and cause a heart attack or stroke.

To find a safe solution to the problem, researchers at the Institute of Medical Sciences and the Institute of Technology in Varanasi, India, and the International Advanced Centre for Powder Metallurgy and New Materials in Balapur, India, have tested the effectiveness of nanosilver particles as an anticoagulant.

Trials with laboratory mice demonstrated that nanosilver particles effectively controlled clumping of platelets irrespective of the disease that caused it.

Hyperactive platelets – those that tended to overcoagulate - obtained from patients having diseases that generated them, showed nanosilver particles significantly inhibited clumping or coagulation in direct proportion to nanosilver concentration. Tests showed that nanosilver also significantly reduced adhesion of platelets to vessel walls and subsequent clogging of the vascular system. The researchers reported that nanosilver significantly retarded the loss of phosphorous (the major component of bone minerals) and reduced the loss of calcium from bones.

Nanosilver has the added value of providing antibacterial action, and it does not collect in the body, because it is systematically eliminated by the liver and kidneys.

Interestingly, the researchers tested nanogold and found no positive effects whatsoever.

The test results *Characterization of Antiplatelet Properties of Silver Nanoparticles*, by Shrivastava, S., et. al., were published in the journal *ACS/NANO* May, 2009.

EPA Policy Towards Nanosilver at Crossroads: SNWG's Volpe

Products that have used silver for decades to fight germs are no different than those using today's nanosilver and are just as safe, according to The Silver Nanotechnology Working Group (SNWG).

In a letter to the US Environmental Protection Agency (EPA), SNWG Executive Director Rosalind Volpe wrote: "Nanosilver is not a new material… The [EPA's Science Advisory] Panel correctly recognized that colloidal nanosilver particles have been registered and used in the market for decades." Citing the Panel's report, she wrote: "There has been considerable use of colloidal silver products with sizes ranging from approximately 2 nanometers up to perhaps 50 nanometers in a variety of products including pesticides, dietary supplements and those used in photography."

"Furthermore, nanosilver materials have been regulated by the EPA for decades with an established record of safe use. Common sense, as well as the Agency's commitment to quality science, would suggest that EPA take this history of safe nanosilver use into account when considering the risk profile of nanosilver materials and as part of making rational regulatory choices," Volpe wrote.

> "Nanosilver is not a new material… The [EPA's Science Advisory] Panel correctly recognized that colloidal nanosilver particles have been registered and used in the market for decades."

"We want the EPA to recognize that the silver products they're looking at are no different than the products they have already registered," Volpe said in an interview with Silver News. "EPA has a long history of safe use for EPA-registered nanoscale silver products stretching over five decades."

She also noted that the EPA is currently acting without a functional definition of what constitutes nanosilver, which adds a layer of confusion to the discussion. Nano means one-billionth and usually refers to one-billionth of a meter. Current EPA nanomaterial policy appears to be based predominantly on the use of the term "nano," independent of the properties of the underlying material. Nanoscale silver used in antimicrobial applications is typically embedded within polymer substrates where any antimicrobial action is achieved through a release of silver ions, a mechanism entirely identical to all EPA-registered silver products including silver salts, silver glasses and silver zeolites.

In conclusion, Volpe wrote: "EPA policy towards nanosilver stands at a critical crossroads. A choice to declare nanosilver as a new material despite decades of historical EPA-registered use in favor of imposing disproportionate and largely redundant data requirements on nanosilver simply to assuage broader generalized conceptions of "nano" will constitute a drastic action ... The multi-decade historical record of safe use specific to colloidal nanosilver materials together with costs AND benefits of policy actions must be taken into account. To do otherwise will be to deny history."

AUSTRIAN MINT

This 10 euro silver coin from the Austrian Mint won the Best Crown Coin award at the Coin of the Year awards in January.

Silver Shines at Coin of the Year Awards

Silver was the star at the Coin of the Year Award ceremony held at the World Money Fair in Berlin in January.

United States Mint Director Ed Moy accepted the Most Popular Coin Award for the American Eagle Silver bullion coins (see story this issue). An intentional lag is built into the selection process, so the awards were given for coins minted in 2008.

The winners are:

Most Historically Significant Coin
100 Tenge Silver
Kazakhstan Mint
Genghis Khan

Best Contemporary Event Coin
10 New Sheqalim Silver
National Bank of Israel
Israel's 60th Anniversary

Best Gold Coin
20 Lati Gold
National Bank of Latvia
Coin of Latvia

Best Silver Coin
10 Euro Silver
German Ministry of Finance
Franz Kafka

Best Crown Coin
10 Euro Silver
Austrian Mint
Abbey of Klosterneuberg

Best Trade Coin
2 Euro Bi-metallic
National Bank of Cyprus
Ancient Statue Cross

Most Popular Coin
United States Mint
One Dollar Silver
American Eagle

Most Artistic Coin
200 Zlotych Gold
National Bank of Poland
Warsaw Ghetto Uprising

Most Innovative Coin
25 Euro Silver
Austrian Mint
Fascination Light

Most Inspirational Coin
2,500 Dollars Gold
Royal Canadian Mint
Towards Confederation

TIFFANY & CO.

The Super Bowl trophy stands 22 inches high and is made of sterling silver.

Tiffany & Company Produces Silver Super Bowl Trophy

When the New Orleans Saints won the Super Bowl this year, they took home a trophy which began as a sketch on a cocktail napkin by one of the world's premier silver makers.

During a l967 lunch meeting between Oscar Riedner, vice president of design for Tiffany & Company and NFL commissioner Pete Rozelle, the 7-pound, 22-inch high sterling silver sculpture of a regulation-size football on a pedestal has not changed in more than 40 years. Unlike some other sports awards, the winning team keeps the trophy since named for legendary football coach Vince Lombardi.

The trophy is still produced in Tiffany's Parsippany, New Jersey facility. Fabrication takes about four months. Based only on the price of silver, the trophy would be worth about US $1,450 but considering the fabrication work, historical importance and other measures, its price has been estimated at about $25,000.

Tiffany has produced additional sport trophies including those for the Preakness Stakes, Belmont Memorial Challenge Cup, World Series Trophy, World Series MVP Trophy, NASCAR Nextel Cup, National Basketball Association Championship Trophy, (re-named in 1984 for Larry O'Brien, the former NBA Commissioner), United States Open Tennis Championship Trophy, and PGA Tour FedExCup Trophy.

"We may be heading toward a time when we can make batteries so tiny that they — and the devices they power — can simply be injected into the body,"

Adding Silver to Batteries May Offer Longer-Lasting Power

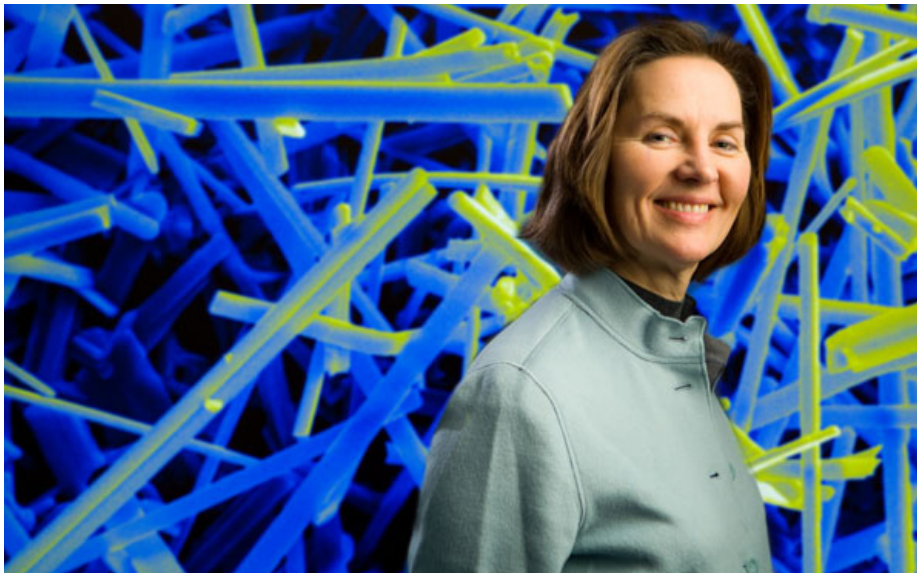
The same research team that 20 years ago developed long-lasting batteries for pacemakers is studying the use of silver particles to improve lithium/silver vanadium oxide batteries that are used in current pacemakers.

The batteries they are developing are 15,000 times more conductive upon initial battery use which could allow the development of higher-power and longer-lasting batteries, which, in turn, could expand their use to other biomedical devices to treat stroke, migraines or Alzheimer's disease.

The new battery materials are being created in the laboratory of State University of New York at Buffalo Distinguished Professor and Greatbatch Professor of Advanced Power Sources Esther Takeuchi, Ph.D., who developed the lithium/silver vanadium oxide battery. She has earned more than 140 patents, believed to be more than any other woman in the United States.

"We may be heading toward a time when we can make batteries so tiny that they — and the devices they power — can simply be injected into the body," Takeuchi says. "What's really exciting about this concept is that we are tuning the material at the atomic level, so the change in its conductivity and performance is inherent to the material. We didn't add supplements to achieve that, we did it by changing the active material directly."

This spring, Takeuchi is teaching the energy storage course in the University of Buffalo's School of Engineering and Applied Sciences and the class is filled to capacity. "I've never seen interest in batteries as high as it is now," she says.



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University of Buffalo researcher Esther Takeuchi is tuning new battery materials at the atomic level in order to realize more powerful, longer-lasting implantable biomedical devices.

Cell Phone Dirty? Toss it in the Dishwasher

The company that has brought us dishwasher-safe computer keyboards, mice and TV remote controls has now introduced a cell phone with antimicrobial silver embedded in the case that also can be tossed into the dishwasher.

The SEAL CELL mobile phone from SEAL SHIELD (www.sealshield.com) is a GSM compatible phone that features a 2.0 megapixel camera with video. It offers Bluetooth 2.0, GPS and a ruggedized touch screen. The SEAL CELL is waterproof to one meter of water pressure and is completely dishwasher safe. The phone also contains SILVER SEAL technology for antimicrobial protection.

Company officials, citing tests at the University of Arizona, say that cell phones are the highest carrier of bacteria of any common appliance with 25,000 germs per square inch, or 500 times more bacteria than the average toilet. The company demonstrated the phone at the international Consumer Electronics Show (CES) in Las Vegas in January. The product will begin shipping soon. Pricing has not yet been released.

American Eagle Silver Bullion Coin Sales Hit All-Time Record, But Demand Exceeded Supply

The United States Mint sold 28,766,000 American Eagle Silver bullion coins in 2009, an all-time record, 46 percent more than 2008 sales of 19,583,000 of the one-ounce coins.

In addition, American Eagle silver bullion sales revenue increased 21.4 percent from $306.4 million in fiscal year 2008 to $372 million in FY 2009, Mint officials noted.

The rise in demand is coming mainly from consumers who see silver as a storehouse of wealth during financially uncertain times, including inflation and a declining US dollar, as well as recognition of silver's growing industrial use as world economies improve. About 50 percent of silver is used in industrial applications.

Because of the surge in demand, the Mint was unable to produce sufficient silver bullion coins in 2009, resulting in rationing bullion coins to its authorized dealers. Late in the year, the Mint announced it would not sell "proof" versions of the coin, disappointing collectors and some investors.

Silver American Eagle Bullion Coins were authorized by Congress in 1985 with the first production run beginning in 1986. The Eagle is struck in 1 ounce, .999 fine silver.

MASLEY ENTERPRISES INC.

The Cold Weather Flyer's glove is fire resistant, can withstand a soaking rain and offers odor protection because of silver in the fabric.

Silver Keeps Combat Gloves Odor Free

Glove maker Masley Enterprises (www.militarygloves.com), has incorporated SmartSilver antimicrobial protection into its Cold Weather Flyer (CWF) gloves to keep them comfortable and odor free, according to company officials.

"Our *CWF* combat gloves provide a unique combination of protective and dexterity benefits not previously available in military gloves," says Frank Masley, the company's founder and designer. "The *CWF* gloves offer breathability, waterproofness and flame resistance yet are pliable so that soldiers can easily operate their weapons and equipment. The non-melt antimicrobial SmartSilver fabric interior prohibits the growth of bacteria that can make the gloves smell - a complaint many soldiers have about other gloves."

Masley said the *CWF* gloves were first tested by troops in Afghanistan and have become a popular product with soldiers there. As a result, Masley increased its supply of the glove to the military by 50 percent during 2009 and will increase supply again in 2010. Both Masley and NanoHorizons, the maker of SmartSilver antimicrobial additives, recently moved to larger facilities with expanded manufacturing capacity to keep up with increasing demand.

Silver Prices 1979-2010

2010	High	Low	Average
Feb	16.74	14.82	15.90
Jan	18.78	16.18	17.71
2009	**High**	**Low**	**Average**
Dec	19.30	17.02	17.69
Nov	18.77	16.43	17.86
Oct	17.89	16.17	17.17
Sept	17.41	15.04	16.50
Aug	14.98	13.87	14.40
July	13.99	12.64	13.38
June	15.95	13.57	14.62
May	15.60	12.48	14.11
Apr	13.02	11.79	12.50
Mar	13.86	11.95	13.09
Feb	14.49	12.30	13.41
Jan	12.56	10.42	11.39
Year	**High**	**Low**	**Average**
2009	19.30	10.42	14.68
2008	20.69	8.79	14.97
2007	15.50	11.47	13.38
2006	14.85	8.82	11.62
2005	9.00	6.43	7.32
2004	8.21	5.51	6.67
2003	5.98	4.35	4.89
2002	5.11	4.22	4.60
2001	4.81	4.03	4.36
2000	5.55	4.56	4.97
1999	5.76	4.87	5.22
1998	7.26	4.62	5.51
1997	6.34	4.16	4.88
1996	5.82	4.68	5.18
1995	6.10	4.38	5.19
1994	5.78	4.57	5.28
1993	5.44	3.52	4.30
1992	4.32	3.63	3.94
1991	4.55	3.51	4.03
1990	5.35	3.94	4.82
1989	6.20	5.02	5.47
1988	8.06	6.01	6.53
1987	11.25	5.35	6.99
1986	6.32	4.85	5.49
1985	6.89	5.48	6.14
1984	10.17	6.25	8.15
1983	14.74	8.38	11.46
1982	11.30	4.81	7.93
1981	16.53	7.97	10.53
1980	50.35	10.20	20.66
1979	35.00	5.93	11.20

(COMEX settle)

Silver Ions Produce Artificial DNA for Microscopic-Sized Machines

As electronic gear like smart phones and netbooks become smaller, developers are seeking ways to produce microscopically tiny components like switches and motors to produce this equipment. During the past few years, DNA – the biological double-helix structure that contains our genetic information – is being tested in place of materials like plastic and metal in super-small devices. The only problem is that DNA is inherently fragile and doesn't stand up to physical stress.

Now, scientists in Germany and Switzerland may have an answer.

Inserting silver ions into artificial DNA molecules maintains the original size of the DNA structure but gives it a more rigid frame. Professor Jens Müller from the Institute of Inorganic and Analytical Chemistry at the University of Munster and researchers from the University of Zurich have produced an artificial DNA molecule with a razor-thin 'wire' inside. This produces a stronger DNA molecule which can be used without risk of structural failure.

According to Muller, the research team replaced some nucleobases – parts found inside DNA – with silver ions producing a strong bond that does not change the DNA's shape but shores up the structure so it can be used in microscopically-small components, such as motors used to distribute medicine inside a patient's body or incredibly tiny transmitters used in spacecraft.

Because of their small size, artificial DNA molecules are being used to build micromachines and silver is helping to strengthen the structures.

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