

Kompanija koloid – pametne inovacije

Trajna ultrazvučna integracija jona srebra za biomedicinsku primenu



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Izvod

Istraživanja i rezultati primene koloidnog srebra u cilju zadovoljenja zdravstvenih (medicinskih) potreba, ukazuju kako na mogućnosti, tako i na opravdanost primene i perspektive razvoja tehnologije jo-na srebra u pogledu unapređenja zdravlja i kvaliteta življenja.

Ključne reči: Inovacije; razvoj; koloidno srebro

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U svakom inovacionom procesu prva faza je uvek proces kreiranja ideja, a upravo se ovom premisom vodila i visokotehnološka nacionalna kompanija Koloid, sa sedištem u Beogradu i Moskvi, kao i poslovnica u širem regionu, koja je još pre 15 godina imala viziju da je tehnologija dobijanja koloidnog srebra i njegova integracija u biomaterijale budućnost. Na taj način, idući korak ispred vremena, Koloid je uspeo da svojim inovacijama inicira promene u sferi biomedicine.



1. SPECIFIČNOSTI KOMPANIJE KOLOID

U vreme ubrzanog napretka tehnologija, kompanija Koloid je fokusirana na implementaciju najsavremenijih tehnoloških rešenja, koja nisu samo dizajnirana da obezbede specifičnu namenu, već i da pruže drugačije korisničko

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iskustvo. U sopstvenoj laboratoriji i proizvodnom pogonu, ova kompanija u svoja medicinska sredstva široke namene, ultrazvučnom jonizacijom trajno integriše jone srebra čistoće 99,99 Ag+ u nevidljivi molekularni film (1-2 mikrometra debljine), čime se vrši postupak filtriranja i eliminacije patogenih mikroorganizama, a samim tim i neutralizacija njihovog prisustva. Ovo su potvrdili i rezultati testiranja obavljani od strane eksperata u Institutu za nuklearna istraživanja Vinča i Fakulteta medicinskih nauka (Institut za javno zdravlje Kragujevac), sa kojima Koloid saraduje, a rezultati eksplicitno dokazuju da izloženost emitovanja koloidnog srebra korišćenjem medicinskih materijala u koje su joni srebra trajno ultrazvučno integrisani, ubija do 99,9 % bakterija.

2. MOĆ JONA SREBRA, Ag⁺

Nakon višegodišnjeg istraživanja na polju tehnologije jona srebra, savremenim tehnološkim postupkom i po principima najviših svetskih standarda, Koloid testira i proizvodi širok dijapazon medicinskih materijala vrhunskog kvaliteta, čija se aktivna komponenta (joni srebra) vrlo često dopunjava i drugom aktivnom komponentom (zeolit klinoptilolit), a njihovom trajnom integracijom u tkanine za medicinske svrhe, pruža dugoročnu zaštitu od patogena. Efikasnost korišćenja ovakvih materijala za biomedicinsku primenu se tokom vremena njihovog korišćenja ne smanjuje, jer ovi antimikrobni agensi imaju jako dejstvo, a manju podložnost rezistentnosti, te se njihova bezbedna primena svrstava u red najdugoročnijeg korišćenja, bez nus pojava.

U svojim naučnim ekspertizama, sinergijom znanja i iskustva naučnika i stručnjaka sa *Instituta za nuklearna istraživanja Vinča* i Fakulteta medicinskih nauka u Kragujevcu, Koloid je prepoznao da je koloidno srebro, trajno integrisano u medicinske materijale širokog spektra, najprirodniji branilac svakog organizma. Koloidno srebro se proizvodi nehemijskim, elektrodispersnim postupkom pomoću ultračistog srebra u ultračistoj redestilovanoj vodi. Po svom hemijskom sastavu, to je čista redestilovana voda koja sadrži submikroskopske klastere srebra (fizičko-hemijski fenomen).

Prema sprovedenim studijama koloidno srebro deluje na naše telo na tri različita načina:

Katalitičkom oksidacijom: Kiseonik reaguje sa srebrom, dajući srebro-oksidi. Taj proces daje energiju potrebnu da ćelija deluje, stvarajući adenozin trifosfat (ATP), izvor energije koji ćelija može direktno da koristi.

Reakcijom sa ćelijskom membranom bakterija. Joni srebra se vezuju za ćelijsku membranu bakterija i tako blokiraju njihovo ćelijsko disanje. Mehanizam delovanja srebra zapravo je inhibicija respiratornog enzima ćelije patogenog mikroorganizma. Srebro deluje kao katalizator, blokirajući određene enzime koje bakterije, virusi i gljivice koriste u svom metabolizmu, usled čega ovi izazivači bolesti ostaju bez kiseonika i hrane i raspadaju se. Ovaj proces odvija se tako brzo i efikasno, da nijedan mikroorganizam ne stiže da mutira, odnosno stekne otpornost, dok istovremeno, ćelije tkiva ostaju netaknute.

Prodiranjem u DNK bakterija. Pokazalo se da koloidno srebro prodire i veže se za DNK bakterija, sprečava odvijanje DNK bakterija i stoga trajno blokira njihov proces replikacije. Specifičnost jona srebra ogleda se u činjenici da ono „ne bira“ koju bolest ili virus napada, a njegova efikasnost u eliminaciji patogena je dokazana na više od 650 oboljenja organizma.

Sa druge strane, aktivna komponenta zeolit klinoptilolit, ima strukturu rešetkastog kaveza sa snažnim negativnim nabojem, koji privlači i apsorbira jone pozitivnog naboja (slobodne radikale i ostale štetne tvari). Zbog same strukture materijala i snažnog jonizujućeg dejstva srebrnih jona i zeolita, svi medicinski materijali u koje su ove komponente trajno integrisane imaju produženi efekat delovanja za razliku od drugih medicinskih materijala na tržištu. Klinički je dokazano da Zeolit klinoptilolit (kao i joni srebra), ima snažno antibakterijsko dejstvo, jer vezuje bakterije poput *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, *Candida*, *Shigella Boydi*, *Streptococcus pneumoniae* drugih. Zeolit klinoptilolit podleže procesu jedinstvene tribomehaničke mikronizacije i aktivacije, a dodatkom jona srebra njihova se antimikrobna svojstva multipliciraju.

3. KOLOID – VIŠE OD INOVACIJA

Ako se sagleda način na koji u današnje vreme jedna visoko-tehnološka, inovativna kompanija predstavlja svoje poslovanje, može se uočiti koncept koji se zasniva isključivo na korisničkom iskustvu, jer kompanija Koloid prepoznaje

da usluga ili proizvod sami po sebi više nisu dovoljni. Koloid pruža drugačiji doprinos u primeni najsavremenijih tehnoloških rešenja u korist svojih korisnika, sa tendencijom da postane nezaobilazni akter i partner u razvoju novih tehnologija i njihovoj sofisticiranoj primeni.

Vizija ove kompanije je vrlo vidljiva i odnosi se na povećanje naučnog i tehnološkog kapaciteta kompanije, efikasnim prenošenjem znanja i ekspertize partnera. Uspešno udruživanje i prateće akcije stvaraju novu generaciju eksperata sposobnih da dizajniraju, koordiniraju i sprovode eksperimentalna istraživanja sa jasnom vizijom mape puta, posebno usmerene na razvoj i implementaciju inovacija u sferi tehnologije jona srebra.

Prateći najnovije trendove u nauci i visokoj tehnologiji, Koloid koristi najmodernija tehnološka dostignuća, a u cilju najvišeg standarda usluga, čime će, kao i do sada, kreirati biomedicinske materijale široke namene i na taj način pružati neophodnu i kompletnu zaštitu.

Koloid company – smart innovations

Permanent ultrasound integration of silver ions for biomedical application



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Abstract

The research cited and findings in respect of the application of colloidal silver aimed at meeting health (medical) needs point not only to the possibilities but also to the justification for using and the prospects for developing silver ion technology with a view to improving health and quality of life.

Keywords: innovation; development; colloidal silver

NEWS

In every innovation process stage, one is brainstorming, which is what has been a guide for the high-tech national company *Koloid*, operating from Belgrade and Moscow, and via regional branches, with a vision born 15 years ago that the technology for producing colloidal silver and integrating it into biomaterials was the future. By doing so, and being ahead of its time, *Koloid* has succeeded in initiating change in biomedicine through its innovations.

1. WHAT SETS KOLOID APART FROM OTHERS

In times of rapid technological advances, *Koloid* has been focused on implementing the latest technological solutions, designed not only as purpose-specific, but also to provide a distinct user experience altogether. In its own laboratory and production facility, the company permanently integrates in its wide range of medical supplies silver ions of a 99,99 Ag⁺ purity using ultrasound ionisation forming an invisible molecular coat (1-2 micrometres thick) to filter and eliminate pathogens, resulting in their neutralisation. This was also validated by the findings of the tests conducted by experts at the Institute for Nuclear Research Vinca and the Medical School (Public Health Institute Kragujevac), with whom *Koloid* collaborates, where the findings explicitly prove that exposure to emitted colloidal silver or the use of medical materials with permanently integrated silver ions using ultrasound ionisation kills up to 99.9 % of bacteria.

2. POWER OF SILVER IONS, Ag⁺

Following years of research into silver ion technology, using a state-of-the-art process and in line with the principles of the highest global standards, *Koloid* tests and produces a wide range of top-quality medical materials, where the active component (silver ions) is very often complemented by another active component (zeolite clinoptilolite). The permanent integration of these two components into medical-grade fabrics provides lasting protection against pathogens. The efficiency of using such materials for biomedical application does not diminish over time because these antimicrobial agents are highly effective with a lower susceptibility of becoming resistant, so their safe application ranks them among most durable agents, free from side effects.

In its scientific expertise, by harnessing the synergy of know-how of scientists and experts at the Institute for Nuclear Research Vinca and the Medical School Kragujevac, *Koloid* recognised that colloidal silver, permanently integrated into a wide range of medical materials, is the most natural safeguard of the human body. Colloidal silver is produced using a non-chemical electrodispersion method on pristinely pure silver in pristinely pure redistilled water. In terms of its chemical composition, it is pure redistilled water containing submicroscopic silver clusters (a physical-chemical phenomenon).

Studies show that colloidal silver works on our body in three different ways:

Catalytic oxidation: Oxygen reacts with silver, producing silver oxide. That process provides the energy needed for the cell to function, creating adenosine triphosphate (ATP), a source of energy that the cell may directly use.



Reaction with the bacterial cell membrane. Silver ions bind to the cell membrane of bacteria, blocking their cellular respiration. Silver works to inhibit a pathogen cell's respiratory enzyme. Silver acts as a catalyst blocking certain enzymes, which bacteria, viruses and fungi use in their metabolism. In the process, these infectious agents are starved of oxygen and nutrients and then decay. It happens so fast and so effectively that no microorganism can mutate or become resistant. At the same time, our tissue cells remain intact.

Penetration into bacterial DNA. It has been demonstrated that colloidal silver penetrates and binds to the bacterial DNA, prevents bacterial DNA unwinding, and therefore permanently blocks the bacterial replication process. What sets silver ions apart is the fact that they "do not choose" which disease or virus to attack, and their effectiveness in eliminating pathogens has been proven on more than 650 conditions.

On the other hand, zeolite, as an active component, has a cage structure with a strong negative charge, attracting and absorbing positively charged ions (free radicals and other harmful substances). Owing to the structure of the materials and the strong ionising effect of silver ions and zeolite, all medical materials into which these components are permanently integrated have a prolonged effect unlike other medical materials on the market. It is clinically proven that zeolite clinoptilolite (as well as silver ions), has a potent antibacterial effect, as it binds bacteria such as *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, *Candida*, *Shigella boydi*, *Streptococcus pneumoniae* and others. Zeolite clinoptilolite undergoes unique tribomechanical micronisation and activation, and the addition of silver ions boosts the antimicrobial properties.

3. KOLOID – MORE THAN A VISION

If we look at how a high-tech innovative company presents its business nowadays, there is a noticeable, purely user-experience look to it, as *Koloid* recognises that a service or product *per se* is no longer sufficient. *Koloid* lends a different contribution to the application of the latest technological solutions to benefit its customers, endeavouring to become a go-to participant and partner in developing the latest technological solutions and their sophisticated application.

The company's vision is crystal clear and centres on bolstering the scientific and technological capacity of the company, through the efficient transfer of partners' know-how. Successful collaboration and related activities create a

new generation of experts capable of designing, coordinating, and conducting experimental research with a clear vision of the road ahead, focused on developing and implementing innovations in silver ion technology.

By keeping abreast of trends in science and high-tech, *Koloid* employs state-of-the-art technological advancements to ensure the highest service standards, providing its customers, as it has done so far, with a wide range of medical materials and by doing so affording the full protection needed.