



For research and personal use now available.

The dilemma to limit the use of the NPPU only for research and not for personal protection is disturbing.

The NPPU can contribute to limit Covid/Corona transmission and is now available as a nose-insert, without any health claims, because medici are not eager to investigate its properties in more details as soon as possible.

Pharma companies will not invest time and money into NPPU research. It is too cheap and too simple and only limitedly protected.

All relevant information on the development of the NPPU is presented on our website and/or can be requested.

The NPPU can now be ordered for research and personal use on www.waterandmineralsadvice.com

The NPPU, the Nose Personal Protection unit,

The NPPU is a small pure copper nose insert, which reduces the transmission and infection risk, based on all available literature and the initial tests.

An extensive study of the properties of bacteria and viruses, the innate immune system, the current patents, the chemistry of copper and the medical and nutritional properties of copper show the potential opportunity of the NPPU.

Based on our knowledge of essential minerals such as copper in nutrition and the overload on publications on the use of copper as an antibacterial and antiviral material we invented and designed a slow copper releasing nose insert.

The release of copper ions into the nose mucus is sufficient to kill bacteria and damage viruses, which are captured by the mucus of the respiratory system.

Why does the NPPU work?

The copper nose insert is in close contact with the produced mucus of the nasal septum, where the copper ions are released based on the solubility of the formed copper oxide surface of the NPPU.

The copper oxide is formed on the surface of the copper metal due to the reaction of copper in the presence of water in the mucus and oxygen in the inhaled and exhaled air.

The solubility of copper oxide is higher than the solubility of metallic copper in a mainly water-based substance as the nasal mucus, and thereby more effective.

The nasal mucus is distributed and mixed throughout the nasal and troth area, which is the first line of defense and a perfect filter against bacteria and viruses entering the human body by air.

The mucus produced by the underlying epithelium cells contain immune cells, which attack the bacteria and viruses, when they are recognized by the innate immune system.



The result of killing bacteria in the nasal mucus is that the viscosity of the mucus is reduced, resulting in a shorter residence time of the bacteria and viruses captured. The mucus is removed from the nasal area via the troth to the stomach where the bacteria and viruses are destroyed. **(Demonstrated by initial experiment.)** A small part of the mucus is exhaled and transmitted to the environment.

Damaged viruses and damaged bacteria are always recognized as foreign by the innate immune cells and attacked by these cells, resulting in an even lower concentration of bacteria and viruses in the mucus of the respiratory track. The increased innate immune cells activity also increases mucus production and thereby improves removal of the bacteria and viruses from the respiratory track.

Viruses need bacteria to hide, transport and multiple also in the mucus. If the virus is inside not-as-foreign identified bacteria it will be present as long as the bacteria are present in the mucus.

The bacteria in the mucus, which are not recognized by the innate immune cells as foreign invaders, are left intact and may stay in the nasal area, when not removed by the mucus flow to the stomach.

The nasal mucus composition is low in nutrients, resulting in limited grow opportunities for invading not-recognized bacteria and, by up to 30% of the human population, bacteria colonies in the nasal area are formed and present for longer periods.

The mobility of bacteria in the mucus is controlled by their behavior with respect to beneficial and toxic concentration gradients. Copper is also an essential mineral for bacteria to grow.

The copper ions in the mucus initiate not only the killing of bacteria, due to lysing by eating too much copper. But they also initiate movement of stationary bacteria colonies in the directions of a high copper concentration gradient, thereby making them susceptible for transport to the stomach. **(Demonstrated by initial experiment.)**

Ultimately a substantial reduction of viruses and bacteria occurs is present in the nasal and troth mucus due to the removal to the stomach and attack by the immune cells in the mucus.

Why is the NPPU safe to use?

Copper in the body is known for decades as the copper-based IUD contraceptive. The copper is dissolved in the mucus produced by the epithelia of the vagina. Any negative interactions of the copper ions on the epithelia in the vagina should already have been recognized and identified if present, based on the forty years of experience worldwide.

Although the epithelium of the vagina is different from the nose and troth epithelia, they are fundamentally made of the same identical cells, with different activities of the cells to adjust to the different environment they are living in.

The Roman soldiers, two thousand years ago, used copper as an anti-bacterial tool by contacting copper tools to wounds as they had learned from the Greeks.

The measured maximum copper ion concentration of the NPPU in water is 1.5 mg/l, resulting in an actual amount on copper added to the nasal mucus of less than 0.1 mg/day, which is comparable with the copper content of a portion of potatoes.

The Recommended Dietary Allowance (RDA) on copper is approx. 1 mg/day.



The limited release of the copper ions based on its solubility makes the NPPU extremely safe to use. Overdosing is not possible!

Free copper ions are just a limited time present in the mucus, but still long enough to have a pronounced effect on the bacteria and virus population in the mucus. When the copper ions enter the troth, they are masked by the organic compounds from the saliva. When the copper ions enter the plasma, they are masked by the amino acids. In both cases the copper ions are added to the storage in the liver to enforce the immune system.

Based on literature, a potential threat may be the removal of bacteria normally present in the mucus and on and in the epithelia due to the reaction of the copper ions. This possible negative effect is comparable with the use of an antibiotic in general and specific when locally applied to the nasal area.

Widely documented is the destruction of bacteria in the epithelia and thereby making them more accessible for infection due to the oral and intravenous intake of antibiotics in general for the last seven decades.

Patients are prescribed antibiotics prior to hospitalization, that are directly being applied to the epithelia in the nasal area as a preventive measure against MRSA bacteria transmission. This makes the epithelia more accessible for infection, which should have been investigated as it is being used for the last decade.

What is the difference between in the body and in the mucus?

As long as viruses or bacteria are present in the mucus, and thus still outside the body, an infection will not affect the delicate life supporting systems in the body.

The mucus formed by the epithelia cells also produces and supports the innate immune cells, which capture and destroy recognized body foreign substances, as viruses and bacteria.

The innate immune system is the fastest active defense system against bacteria and viruses and is active in the body and in the mucus; as the innate immune cells recognize foreign substances and most microbes, even before they infect the body. When recognized they are captured, destroyed and removed from the mucus to the stomach.

The adaptive immune system is mainly operating in the body and reacts several days after an infection has taken place.

What is the function of copper in the human body?

Copper is an essential mineral needed for a proper operation in multiple critical biochemical reactions, as coenzyme and other organic copper component.

Copper hold-up in the body is approximately 100 mg. The main body part that contains high copper concentrations are the liver, the heart, the brain and the kidneys.

Copper absorption and desorption in the body is controlled by hormones with several feedback control loops to control optimal copper hold up and copper concentration in several active molecules.



Absorption of copper as ions takes place in the thin intestine. The copper ions are masked by amino acids in the plasma and transported to the liver, where they are converted.

In humans, copper is essential for the proper functioning of organs and metabolic processes. The human body has complex homeostatic mechanisms which attempt to ensure a constant supply of available copper, while eliminating excess copper whenever this occurs.

Copper stimulates the immune system to fight infections, to repair injured tissues and to promote healing.

Copper is an essential mineral needed for both – innate and adaptive - immune systems. Its storage in the liver is needed to fight infections. If insufficient copper is present it is retained for other body parts to combat the infection.

Copper cannot be made by the body and is only maximally needed in case of an infection. Copper storage is critical in these times of high risk of infection with Corona and or Influenza. Excessive copper uptake by consumption should not involve toxic concentrations. Advised is to consume sufficient copper always in combination with other food and or other vitamins and essential minerals to avoid toxic concentrations. The regulatory system of uptake and removal of copper should always be within its operational boundaries.

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Links to general information on copper

Copper in health

https://en.wikipedia.org/wiki/Copper_in_health

Contact Killing of Bacteria on Copper Is Suppressed if Bacterial-Metal Contact Is Prevented and Is Induced on Iron by Copper Ions

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3623184/>

Copper uptake and resistance in bacteria

<https://pubmed.ncbi.nlm.nih.gov/8437513/>

Copper Fact Sheet for Health Professionals

<https://ods.od.nih.gov/factsheets/Copper-HealthProfessional/#h10>

Antimicrobial properties of copper

https://en.wikipedia.org/wiki/Antimicrobial_properties_of_copper

Inactivation of Influenza A Virus on Copper versus Stainless Steel Surfaces

<https://aem.asm.org/content/73/8/2748>

Is copper beneficial for COVID-19 patients?

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7199671/>

Virus inactivation by copper or iron ions alone and in the presence of peroxide.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC195916/>

Using copper to prevent the spread of respiratory viruses

<https://www.sciencedaily.com/releases/2015/11/151110102147.htm>