

Copper Nanotechnology: HIV Is No Longer a Reason Not to Breastfeed



2020-04-06

Copper3D, a leading innovator in the field of antimicrobial 3D printing, has incorporated nanocopper into PLA and TPU polymers to develop a 3D printed device that enables mothers who are suffering from HIV to safely breastfeed their babies without worrying about transmitting the disease to them.

[Copper3D](#), a [Chile](#)- and U.S.-based antibacterial solutions provider, has recently worked on a project to create an antibacterial 3D printed device to mitigate the risk of HIV transmission during breastfeeding. The company has created a novel product through the usage of copper nanotechnology and the addition of antimicrobial properties to PLA and TPU polymers.

The antimicrobial capacity of the filament device includes inactivation of the HIV virus, by acting against the protease. The copper ions inactivate the deadly virus by degrading the phospholipidic plasmatic membrane and denaturalizing the nucleic acids. However, the technique still involves some potential issues including nutritional degradation and increase the toxicity levels, among others.

As per UNICEF's statistics, in 2017, the number of HIV-infected children and adolescents reached 3 million, with the record of newly infected people reaching 430,000 and AIDS-related deaths amounting to 130,000. In 2018, over 26,000 children up to 14 years of age were reportedly infected with HIV at birth due to the non-treatment of pregnant mothers as well as transmission through breastfeeding, which is considered as the main route of infection. Despite these records, the WHO reported that nearly 37.9 million people were living with HIV at the end of 2018, with around 8.1 million people unaware of their condition.

According to a statement made by Copper3D's Medical Director Dr. Claudio Soto, the advanced role of the antimicrobial materials and few available studies related to HIV infection have led to the development of ideas to introduce the certain device to act as an interface between the mother and child, to avoid transmission through breastfeeding.

A preliminary study was conducted by Copper3D using PACTIVE, the material that contains copper nanoparticles with high viral inactivation capacity, which was introduced into samples of HIV-infected breast milk.

The favorable results from this study allowed the company to be well prepared for the second phase of the study; designing a nano-copper embedded device for use in breastfeeding, with different shapes and designs to increase the contact level with the breast milk.

Read the [original article](#) on 3DPrint.com.