UoM develops 3D sponge from bovine bone to stop severe bleeding

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BINITA JAISWAL @Chennai

RESEARCHERS from the University of Madras (UoM) have developed an innovative biomedical product - nanostructured 3D sponge - using calcium phosphate (CaP) derived from bovine bone biowaste that can rapidly control bleeding while simultaneously supporting natural bone regeneration. Other products like a porous scaffold, microspheres, and a fibrous patch have also been developed by the researchers.

The research was carried out by Shalini Thomas at the National Centre for Nanoscience and Nanotechnology (NCNSNT), UoM, under the guidance of professor Balakumar S.

The work has been published in three different research publications in Scopus-indexed journals, and one patent has been granted to the duo for developing "a nanostructured crystalline hydroxyapatite powder from natural bio-waste and the method of preparing it", while another patent regarding the 3D sponge has been filed.

The newly-developed 3D sponge is soft, lightweight and has shape retention properties similar to a natural sea sponge. It is designed to quickly absorb blood and trigger rapid clotting. It also acts as a scaffold that supports bone structures where new bone cells can attach, grow, and regenerate damaged areas.

Balakumar, director of Research Schemes & Projects and professor at NCNSNT, said, "With its dual function, the 3D sponge and porous scaffold could become a safer alternative to traditional bone grafts and conventional wound dressings. Instead of traditional cotton, the sponge has the potential to be used in emergency medical kits. After successful animal trials, we are now awaiting approval for clinical trials. We also require funding to develop blanket size of the sponge."