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Japan discovers new type of bone repairing material

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This could allow greater control of the bone healing process in the body

Ceramics and metals have been used for a while as structural materials to repair bones and joints. In the past, scientists engineered bioinert materials, which do not bond to bones directly; bioactive materials that can bond to bones; and bio-absorbable materials that are categorized in bioactive materials but they are absorbed by the body over time and are replaced by advancing bone tissue.

Now, a fourth type of bone repairing materials has been found: a bio-responsive ceramic that interacts with an enzyme found in blood to be absorbed into the body at a precise and predictable rate.

The research was done by Taishi Yokoi, an associate professor at the Japan-based Institute of Biomaterials and Bioengineering at Tokyo Medical and Dental University, and his colleagues.

At the heart of this discovery is a biological reaction: an enzyme called alkaline phosphatase (ALP), which is present in human serum and reacts with various phosphate esters to generate bone mineral known as hydroxyapatite.

"We expect the findings of this study will be applied towards designing and developing novel bone-repairing materials with precisely controlled degradation and resorption rates inside the body," says Yokoi.