

# The Synthesization of biocomposite materials of Hydroxyapatite/beta-tricalcium phosphate/biopolymer scaffold for bone tissue regeneration

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Loss and damage of bone tissue is the one of the most troubling problems that jeopardize human health. Therefore, over the past decade, synthesization biocomposite materials for bone tissue engineering is becoming increasingly interested. In this study, Bio-composite material composed of hydroxyapatite/beta-tricalcium phosphate (BCP) (inorganic) and chitosan/alginate (ChiAlg) (organic) (BCP@ChiAlg) with the three different ratios of 1:1, 2:1 and 3:2 wt/wt (chitosan/alginate) were synthesized. The mechanical properties and the in vitro growth of rat osteoblast-like UMR-106 cells were investigated. The results indicate that the mechanical strength and bioactivity are controlled by the chitosan and alginate ratio. The obtained result from this study shows the composition of 3:2 by wt ratio is the most effective ratio with the compressive strength of 6.31 MPa. It was obtained the significant increase in cell availability and high cell activity. These characterizations reveal that a composite of BCP@ChiAlg is one of interested biocomposite materials for application in bone tissue engineering.

**Primary author:** Mr CHAIJIRAWIWAT, Chawit (Department of Physics, Mahidol Wittayanusorn School, Thailand)

**Co-authors:** Mr TRIKASEMMART, Metha (Department of Physics, Mahidol Wittayanusorn School, Thailand); Mr KOPATTA, Pornchai (Department of Physics, Mahidol Wittayanusorn School, Thailand); Mr NAPHATHRATHORN, Tanasate (Department of Physics, Mahidol Wittayanusorn School, Thailand)

**Presenters:** Mr CHAIJIRAWIWAT, Chawit (Department of Physics, Mahidol Wittayanusorn School, Thailand); Mr TRIKASEMMART, Metha (Department of Physics, Mahidol Wittayanusorn School, Thailand); Mr NAPHATHRATHORN, Tanasate (Department of Physics, Mahidol Wittayanusorn School, Thailand)

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