



# Elucidating and modulating macrophage and stem cell responses to bioactive nanoclays for bone regeneration

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Recently, it has been well recognized that the inflammation process is tightly related to the regeneration and repair of biological tissue. Although inflammation is initially required for tissue regeneration and repair, continuous and chronic inflammation often impairs tissue regeneration and repair. Therefore, it is indispensable to recruit the endogenous stem cells to terminate the inflammation in the site to be regenerated toward the effective induction of tissue regeneration and repair. It is well known that macrophages are involved in the entire inflammation process and possess two contrary phenotypes of “pro-inflammatory” and “anti-inflammatory” to modulate the inflammation process. Through the tight Japan-UK collaboration, this project will create a novel biomaterial which enables the recruitment of endogenous stem cells and induce the anti-inflammatory phenotype of macrophages based on the fusion of each original biomaterial technology (gelatin hydrogel microspheres and bioactive nanoclays) and aim at the efficient induction and elucidation of bone regeneration.

