(Title of the research)

New treatment applying a biological foreign body response for critical bone defect

Primary Researcher: Takushi Nakatani, Postgraduate Student

University of Tsukuba, Graduate School of Comprehensive Human Sciences **Co-researchers:** Hajime Mishima, Associate Professor Department of Orthopaedic Surgery, University of Tsukuba Sho Totsuka, Postgraduate Student University of Tsukuba, Graduate School of Comprehensive Human Sciences Ryunosuke Watanabe, Postgraduate Student University of Tsukuba, Graduate School of Comprehensive Human Sciences

The Masquelet technique is a novel treatment for massive bone defects in the long bones of the limbs. Bone cement is placed in the defect and left in place for several weeks to induce a membrane derived from the foreign body reaction. Removal of the bone cement and placement of a bone graft within the membrane promotes bone healing. In this study, the effects of human basic fibroblast growth factor (bFGF), which promotes fibrogenesis and vascular endothelial cell proliferation, and parathyroid hormone (PTH), which promotes bone metabolism, on the induced membrane were investigated with a rat femur bone defect model. The results showed that local administration of bFGF to the defects and systemic administration of PTH had no significant effect on the membrane area and vascular lumen area of the induced membrane. The type of spacer and tissue assessment methods need to be reconsidered in the future.