Cell migration under ultrasound irradiations in micrometer scale
SHINYA MURAKAMI, YO OTSUKA, Graduate school of Bioscience, Aoyamagakuin University, YUSUKE OSHIMA, Translational Research Center, Ehime University Hospital, ATSUHIKO HIKITA, Graduate School of Medicine, Ehime University, TOSHIYUKI MITSUI, Graduate school of Bioscience, Aoyamagakuin University — Cell movements, migration play an important role in many physiological processes including cell proliferation and differentiation. C2C12, a line of mouse myoblasts is known to differentiate into osteoblast under appropriate conditions. Therefore, C2C12 cells can be chosen for the differentiation studies. However, the movement of the C2C12’s has not been fully investigated although the movements may provide a better understanding of the healing processes of bone repair, regeneration and differentiation. In addition, low intensity ultrasound has been thought and used to promote bone fracture healing although the microscopic mechanism of this healing is not well understood. As a first step, we have investigated single cell migration of C2C12 under optical microscopy with and without ultrasound irradiations. The ultrasound is irradiated from an apex of a sharp needle. The frequency is 1.5 MHz and the power intensity is near 24 mW/cm². These values were similar to the ultrasound treatment values. In this conference, we will show the influence of the ultrasound irradiation on the cell movement by plotting the mean squared displacement and the velocity autocorrelation function as a function of time.