Cell Mechanics: Measuring Stiffness in Osteosarcoma (Bone Cancer) Cells

This Diploma work will develop a method to determine the elastic modulus of human osteosarcoma (HOS) cells. The method involves shear assay experiments that will eventually be used in so called “inverse finite element analysis”. Cell deformations during shear assay experiments will be digitally recorded, and image processing techniques will be used to determine the local displacement and the resulting strain field. Finite element will then used to determine the Young’s moduli of HOS cells.

The work will focus primarily on the construction of the experimental set-up, followed by preliminary experiments to obtain data. Existing tracking algorithms will then be implemented to analyze the data, and infer the cell strain field.