

Fine-tuning of biological interfaces towards directed cell response

Cells can sense and respond to their local environment. Therefore, engineering the material properties so that it can interface with cells and elucidate specific biological responses is key step in biomaterials design. Based on molecular recognition, the effects on cell-receptor ligand concentration have been evaluated by creating low-slope gradients that provide single-cell microenvironments of one particular concentration. The effects on ligand concentration and distribution have also been addressed by exploiting the auto-assembling properties of nanomaterials on surfaces. Results showed that ligand presentation to cells has a main role in the ligand-receptor crosstalk in order to produce sustained cell signaling effects.