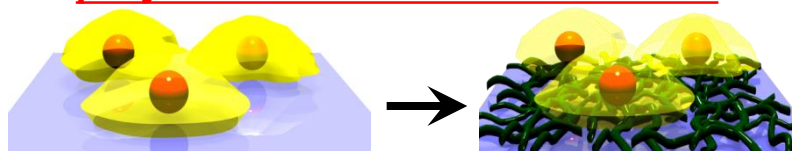


Biomaterial Interface Design for the Regulation of Cellular Functions

Associate Professor Takashi Hoshiba

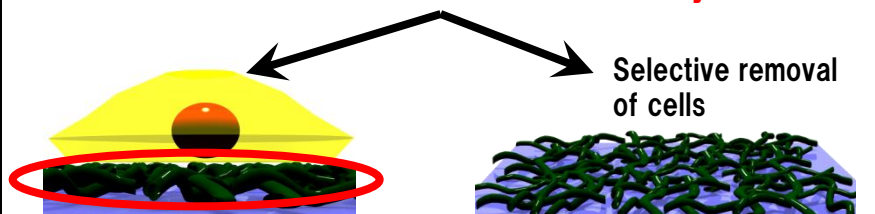
Analysis and application of cell-polymeric biomaterial interface



In vitro cell culture on biomaterials

Extracellular matrix protein deposition during cell culture

Biomaterial interface can be remodeled by the cells



i) Analysis of biomaterial interface remodeling during cell culture

Selective removal of cells

ii) Deposited extracellular matrix as new cell culture substrata

Mechanisms that regulate cellular functions on polymeric biomaterials

New biomimetic cell culture substrata

Design and development of new biomaterials regulating cellular functions

Also, I am trying to unveil new biological mechanisms with my biomaterials

Content:

Polymeric biomaterials are applied in large biomedical fields. When these materials are implanted in the body or are interacted with the cells, extracellular matrix (ECM) proteins are deposited at biomaterial interfaces and they decide the functions of biomaterials in the body and the fate of cultured cells. It is important to design biomaterial interface for exerting of expected functions of biomaterials and regulating of cellular functions *in vitro*. I develop new biomaterials regulating cellular functions by the design of biomaterials interface as below. Through these researches, I will contribute to the progress of regenerative medicine and bio-industry.

i) Analysis of biomaterial interface remodeling during cell culture.

I analyze the remodeling of biomaterials interface with the techniques of cell biology, polymer science, and interface science to achieve the development of biomaterials regulating cellular functions.

ii) Cell culture substrata mimicking microenvironment in the body.

ECM proteins deposited during the cell culture are prepared as new biomimetic culture substrata to regulate cellular functions.

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