Nanotech

Advanced Microsystem Based on Bio-Degradable/Dissolvable Materials

Host Professor Pr. B.J. KIM

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Context

In recent years, biodegradable materials have attracted so much attention due to their potential applications in the realizing the fully implantable device and microsystems [1-3]. These biodegradable materials show remarkable bio-compatibility, which can be decomposed and absorbed by biologic body without harm. Due to the unique properties, biodegradable materials have been widely used as biocompatible package, drug & gene delivery, rapid prototyping for biologic regeneration, and so on.

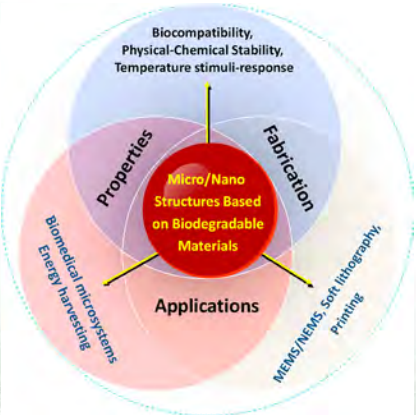

Fig. 1. Schematic view of key scientific points of this project.

Objectives & Methods

In this project, we will introduce the micro/nano fabrication technology to the bio-degradable material to realize some functional materials, structures and devices. One of the core targets is employing the micro-electro-mechanical systems (MEMS) fabrication technologies to the bio-degradable materials, then realizing specific structures, such as free-standing membrane, ultra-thin transparent film, and so on. Therefore, our aim is to employ micro and nanotechnology to accurately control and deeply investigate the bio-degradable materials at micro/nano level, and develop novel materials for multiple application fields, such as biomedical field and energy harvesting [4].

Results

This is the first year of this project, and we have obtained the preliminary results for the fabrication of triboelectric nanogenerator, whose maximum peak-peak voltage achieved up to about 500 V. This high-output energy harvester shows the attractive potential in the integrated flexible electronics and wearable device.

References

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[2] C. Vauthier, et al. Advanced Drug Delivery Reviews, 2003, 55, 519-548.
[3] H. Fu, et al. Soft Matter, 2011, 7, 3546-3552.