Application of femtosecond laser µ-processing in biomedical and material in KRISS

Sae Chae Jeoung, PhD

Korea Research Institute of Standard and Science, Daejeon, 305-340, Rep. of Korea

Ultrafast laser facilities and their users have grown rapidly and have feasted new important discoveries and excitement in various scientific and technological areas. Drastic improvements in temporal, spatial, energetic and spectroscopic characteristics have been realized after its invention. Upon excitation with the fluence high enough to occur irreversible events, negligible damage on target materials outside directly exposed area of ultrafast laser allow one to treat biological samples like live cell membrane and to remove thin films as well as bulk materials for many application fields including micro-optics, electronics, and even biology under extremely high precision. For realizing the fs-laser micro-processing in industrial and medicinal application, however, it is crucial to find a way to overcome their low productivity and enhance the selectivity. In this presentation, some of attempts and discoveries to solve these issues related to optical engineering and micro-surgery in KRISS are summarized to demonstrate the unique features and opportunities of ultrafast laser. The first part of my talk will devote to explain the trials for biomedical application with exemplifying the selectivity such as the removal of angiogenetic blood vessels without apparent damage in surround normal tissues and selective patterning of layered thin film solar cell without prominent damage on undesired part of the target. And also, brief introduction on the modification of soft materials like PDMS to form the superhydrophobic surface and its application will be given in the last part of the target.



Biography

Dr. Sae Chae Jeoung received her B.S., M.S. and Ph.D. degrees from Seoul National University in Seoul, Korea, in 1986, 1988 and 1992, respectively. He was a visiting scientist at Institute of Molecular Science (Okazaki, Japan, 1997). Dr. Jeoung is currently tenured principal research scientist at KRISS and also a Professor in the Department of Medical Physics at University of Science and Technology (UST), Daejeon. He has contributed over 120 refereed papers and 30 patents. He was the recipient of President's Commendation from Republic of Korea.