Abstract

In this lecture, at first, overview of the research activities at Nano/Micro System Engineering Laboratory (NMSL) at Kyoto University whose slogan is “Small machine create large opportunities” is introduced. Then, new approach based on DNA nanotechnology is introduced as a promising technology to integrate nanomaterial into MEMS to realize nanosystem. The nanosystem in which multiple nano-scale functional building blocks made of variety of nano-materials integrated with MEMS becomes increasingly important as a key device for next generation. An assembly technique bridging the gap between nano-scale building blocks and micro-scale MEMS is expected to play an important role as a complementary approach for a top down and a bottom up approach.

About the Speaker

Osamu Tabata was born in 1956. He received the M.S. and Ph.D. degrees from Nagoya Institute of Technology, Nagoya, Japan, in
1981 and in 1993. Since 1981, he had been with the Toyota Central Research and Development Laboratories, Inc., Aichi, Japan. In 1996, he joined the Department of Mechanical Engineering, Ritsumeikan University, Shiga, Japan. In 2003, he joined the Department of Mechanical Engineering, Kyoto University, Kyoto, Japan. From April 2005, he is a Professor at the Department of Micro Engineering, Kyoto University, Kyoto, Japan. He was Visiting Professor at Freiburg University at Freiburg in 2000, Germany and ETH Zurich at Switzerland in 2001. He was Senior Visiting Fellow of Chinese Academy of Science in 2010, External Senior Fellows of School of Soft Matter Research, Freiburg Institute for Advanced Studies (FRIAS) at Albert-Ludwigs-Universität Freiburg from 2010, and Guest Professor at Huazong University of Science and Technology from 2011. He is currently engaged in the research of micro/nano process, MEMS and micro/nano system synthetic engineering. Especially, he is focusing on the research to realize a unique and novel nanosystem by assembling the various functional components such as a microchip, a particle, a microcapsule, DNA origami, a cell, etc., with sizes ranging from the nanometer to micrometer scale on a few mm square MEMS substrate. This technology is termed SENS (synthetic engineering for nano systems), and experimental and theoretical research on the establishment of SENS is pursued.

All are welcome!
Enquiry: 3442 8420

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