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Hiratsuka, Japan (PRWEB UK) 8 September 2016 -- Tokai University, Japan launches interdisciplinary Micro/Nano Technology Center (MNTC) for research based on polymer nanosheets.

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Micro/Nano Technology Center, Tokai University
http://www.mnc.u-tokai.ac.jp/

“The polymer nanosheets developed by Yosuke Okamura form the basis for our research at Micro/Nano Technology Center (MNTC),” says Rio Kita, one of eight prominent MNCT researchers. “There are three main groups that specialize in fabrication and synthesis; experimental trials of concepts; and in-depth analysis and modeling.”

In addition to the group leaders, the researchers at MNTC also include highly motivated young scientists from both Japan and overseas. Research at MNTC fuses expertise from a wide cross section of specialties including physics, mechanical engineering, and medicine.

Recent breakthroughs

- Development of a process to produce large areas of nanosheets with sizes of 10cmx50m. This roll-to-roll mass production of nanosheets and their functionalization with “microgravure” printing system to functionalize their surfaces. This approach has enabled the production of 50,000 cm² of nanosheets, compared with 314 cm² by spin coating.
- Microfluidic devices for developing disease models for amyotrophic lateral sclerosis (ALS) and thrombosis without animal experiments and surgeries.
- Fabrication of titanium hollow needles with outer diameter of less than 50 micrometers functionalized to behave as actuators and sensors.
- Analysis of cells using MiSeq DNA sequencer for understanding cell differentiation processes.
- “Nanowrapping” of cells with both porous and non-porous nanosheets for live cell imaging.
- Analysis of the effect of mechanical, electrical, magnetic and thermal stimuli on nanosheets.

The MNCT is a truly interdisciplinary center with international scientists. “We welcome highly motivated scientists to join us in our quest for real-life applications of nanosheets that were developed by our staff,” says Kita. “The pioneering research at MNCT has been underscored by the establishment of the Nikon Imaging Research Center at Tokai University. The Nikon Imaging Research Center houses the latest optical instruments produced by Nikon and is open to all researchers inside and outside of Tokai University as well as for training
students and education.”

Researchers at the Micro/Nano Technology Center (MNTC)

1. Yosuke Okamura, Associate Professor, Department of Applied Chemistry
   Design and fabrication of nanosheets
   Aims: Designing nanosheets with unique properties and devising simple fabrication procedures
   Keywords: Polymer chemistry, Biomaterials, Nanomaterials

   Major recent publications

2. Yuta Sunami, Junior Associate Professor, Department of Mechanical Engineering
   Aims: Mass production of nanosheets using ‘web handling’ technology and their functionalization.
   Keywords: Tribology, Design Engineering, Web Handling

   Major recent publications

3. Kazuyoshi Tsuchiya, Professor, Department of Precision Engineering
   Aims: Development of bio-microsensors on nanosheet technology
   Keywords: Microactuator, Microsensor, Microneedle, Thin film deposition, Sputtering etching, Smart materials.

   Major recent publications

4. Asako Otomo, Assistant Professor, Department of Molecular Life Sciences
Aims: Cell culture and cytopathology on nanosheets for medical applications
Keywords: Neurobiology, Cell biology, Amyotrophic Lateral Sclerosis (ALS), iPSC

Major recent publications


5. Hiroshi Kimura, Associate Professor, Department of Mechanical Engineering
Aims: Applied microfluidic systems for biological and medical science
Keywords: Microfluidic device, Bio-MEMS, µTAS, Organ/Human-on-a-Chip

Major recent publications


6. Rio Kita, Professor, Department of Physics
Aims: Molecular characterization and analysis of polymers
Keywords: Polymer structure, Dynamics, Thermodynamics, Rheology

Major recent publications

7. Kazuya Kabayama, Associate Professor, Graduate School of Science, Osaka University
Aims: Applications of nanosheets to cell analysis and drug screening
Keywords: Live cell imaging, Glycobiology, Lipidbiology, Microdomain, Microscopy

Major recent publications


8. So Nakagawa, Assistant Professor, Department of Molecular Life Science
Aims: Evaluation methods for analysis of interaction between cells and nanosheets and medical applications
Keywords: Bioinformatics, Comparative Genomics, Endogenous Viral Elements

Major recent publications

1. S. Nakagawa, MU. Takahashi, gEVE: a genome-based endogenous viral element database provides comprehensive viral protein-coding sequences in mammalian genomes, Database (Oxford), baw087, (2016).

About Tokai University

Tokai University is a private university established by Shigeyoshi Matsumae in 1942.

"Tokai" of "Tokai University" refers to the sea to the east of Asia, namely the Pacific Ocean, and symbolizes the desire to foster the kinds of big hearts, rich spirits, and broad perspectives symbolized by the expanse of an ocean.

The white cross of the school flag symbolizes "Love" and "Justice," and expresses the presence of "Truth" where love and justice meet.

The Tokai University Educational System is one of the largest general education and research institutions in Japan today. To seek mutual understanding and global peace through the education of, and interaction with, young scholars from around the world, we began accepting foreign students from at early stage and have consistently promoted Japanese-language education.

For more information, please visit
http://www.u-tokai.ac.jp/english/
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