Biography

NAME: Rintaro Higuchi

OFFICE ADDRESS:

International Center for Materials Nanoarchitectnics (MANA),
National Institute for Materials Science (NIMS)
1-1 Namiki, Tsukuba, Ibaraki, Japan 305-0044

DATE OF BIRTH: December 6. 1984

GENDER: Male

NATIONARITY: Japan

LANGUAGES:

English - Moderate
Japanese - Native speaker

EDUCATION and WORKING EXPERIENCE

(March 2008)
Master in Engineering
Graduate School of Science and Technology, Kumamoto University

(April 2008 - March 2010)
Engineer
TERUMO Corporation
Work: Development of medical equipment

(April 2010 - March 2013)
Ph.D. in Engineering
Graduate School of Science and Technology, Kumamoto University
Research: π-Conjugated polymer thin film
Supervisor: Prof. Masashi Kunitake

(April 2013 - March 2014)
Visiting scholar
University of California Los Angeles (UCLA)

Research: Polymer-based atomic switches
Supervisor: Prof. James K. Gimzewski

(April 2014 - present)
Postdoctoral researcher
International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS)
Research: Electrical characterization of conductive network
Supervisor: Prof. Tomonobu Nakayama

RESEARCH BACKGROUND:

Main project:

(1) Electrical characterization of network resistors

(2) Preparation and characterization of polyaniline-based atomic switches

Related research topics:

(1) Morphology control and spectroscopic study of π-conjugated polymer films.

(2) Organic thin film solar cells

(3) STM observation of molecular nanoarchitectures

RESEARCH INTEREST:

My research interest is in the dynamics of the conductive network and brain-like computing based on the network materials. The networks composed of conductive polymer or polymer-coated silver nanowire exhibited spontaneous fluctuation, which behaviors are analogous with biological network system such as neuron activity. I'm presently studying on the investigation of network dynamics, particularly silver nanowire network, using scanning probe microscopy and fluorescent microscopy, and also trying to apply these materials to practical devices.

Publication List

Journal articles

1. Resistance of single polyaniline fibers and their junctions measured by double-probe atomic force microscopy
   Japanese Journal of Applied Physics, **55**, 08NB09-1-4(2016).
   Rintaro Higuchi, Yoshitaka Shingaya, and Tomonobu Nakayama

2. Positional Selectivity of Reversible Azomethine Condensation Reactions at Solid/Liquid Interfaces Leading to Supramolecule Formation
   Journal of Electroanalytical Chemistry, **716**, 145-149(2014).
   Ryota Tanoue, Rintaro Higuchi, Kiryu Ikebe, Shinobu Uemura, Nobuo Kimizuka, Adam Z. Stieg, James K. Gimzewski, Masashi Kunitake

3. Thermodynamic Self-Assembly of Two-Dimensional π-Conjugated Metal-Porphyrin Covalent Organic Frameworks by “On-Site” Equilibrium Polymerization
   Journal of Nanoscience and Nanotechnology, **14**, 2211-2216(2014).
   Ryota Tanoue, Rintaro Higuchi, Kiryu Ikebe, Shinobu Uemura, Nobuo Kimizuka, Adam Z. Stieg, James K. Gimzewski, Masashi Kunitake

4. Vertically standing nanowalls of pristine poly(azomethine) on a graphite by chemical liquid deposition
   Polymer, **54**, 3452–3457(2013).
   Rintaro Higuchi, Ryota Tanoue, Kazuki Sakaguchi, Kaiyo Yanai, Shinobu Uemura, Masashi Kunitake

5. Construction and Characterization of "Molecular Nonwoven Fabrics" Consisting of Crosslinked Poly(γ-Methyl-L-Glutamate)
   Langmuir, **29**, 7478–7487(2013).
   Rintaro Higuchi, Megumi Hirano, Md. Ashaduzzaman, Neval Yilmaz, Tatsunori Sumino, Daisuke Kodama, Sayuri Chiba, Shinobu Uemura, Katsuhiko Nishiyama, Akihiro Ohira, Michiya Fujiki, and Masashi Kunitake

6. Chemical Liquid Deposition of Aromatic Poly(azomethine)s by Spontaneous On-site Polycondensation in Aqueous Solution
   Chemical Communications, **48**, 3103-3105(2012).
   Rintaro Higuchi, Ryota Tanoue, Nobuo Enoki, Yuya Miyasato, Kazuki Sakaguchi, Shinobu Uemura, Nobuo Kimizuka, and Masashi Kunitake

7. In situ STM Investigation of Aromatic Poly(azomethine) Arrays Constructed by “On-site” Equilibrium Polymerization
   Langmuir, **28(39)**, 13844-13851(2012).
   Ryota Tanoue, Rintaro Higuchi, Kiryu Ikebe, Shinobu Uemura, Nobuo Kimizuka, Adam Z. Stieg, James K. Gimzewski, Masashi Kunitake

8. Thermodynamically Controlled Self-Assembly of Covalent Nanoarchitectures in Aqueous Solution
   ACS Nano, **5(5)**, 3923-3929(2011).
   Ryota Tanoue, Rintaro Higuchi, Nobuo Enoki, Yuya Miyasato, Shinobu Uemura, Nobuo Kimizuka, Adam Z. Stieg, James K. Gimzewski, and Masashi Kunitake

9. Coronene-Iodine Coadsorbed Adlayers on Au(111) Surfaces Promoted by Electrochemical Potential Control
   ECS Transactions, **3(34)**, 147-154(2007).
   Masashi Kunitake, Yudai Ishikawa, Shuhei Matsuda, Satoshi Abe, Yuya Miyasato, Rintaro Higuchi, and Masayo Sakata.

Review articles

1. Organic Nanoarchitectures with Well-Defined Nanostructures Produced by Self-Assembly on Surfaces
   Science and Industry, **89(6)**, 162-170(2015).
   Masashi Kunitake, Rintaro Higuchi

2. Self-assembled π-conjugated macromolecular architectures — A soft solution process based on Schiff base coupling
   Current Opinion in Colloid & Interface Science, **19(2)**, 140–154(2014).
   Masashi Kunitake, Rintaro Higuchi, Ryota Tanoue, Shinobu Uemura

3. Preparation of Polymeric Nanomaterials Based on Reaction at Liquid-Liquid and Solid-Liquid Interface
   Journal of Network Polymer, Japan, **33(3)**, 146-153(2012).
   Rintaro Higuchi, Shuhei Kai, Kazuki Sakaguchi, Shinobu Uemura, and Masashi Kunitake

Awards

1. Poster award (2012)
   The 5th International Workshop on Advanced Electrochemical Power Sources
   “Thermodynamic Self-Assembly and *In-situ* EC-STM Observation of Two-Dimensional Poly(azomethine) Nanoarchitectures”

2. Excellent Poster Presentation Award (2015)
   MANA International Symposium 2015
   “Electrical Characterization of Polyaniline Networks Using Multiple-Probe System”