since 2016 MRG

MINAMI LAB.

[Applied Supramolecular Chemistry]

Department of Materials and Environmental Science

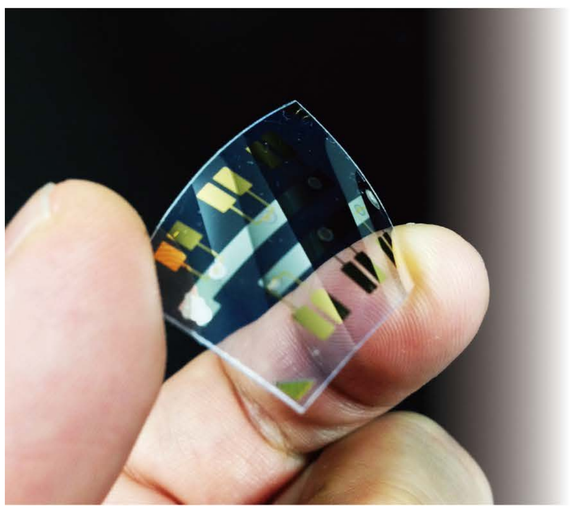
Supramolecular Materials Design

Department of Chemistry & Biotechnology

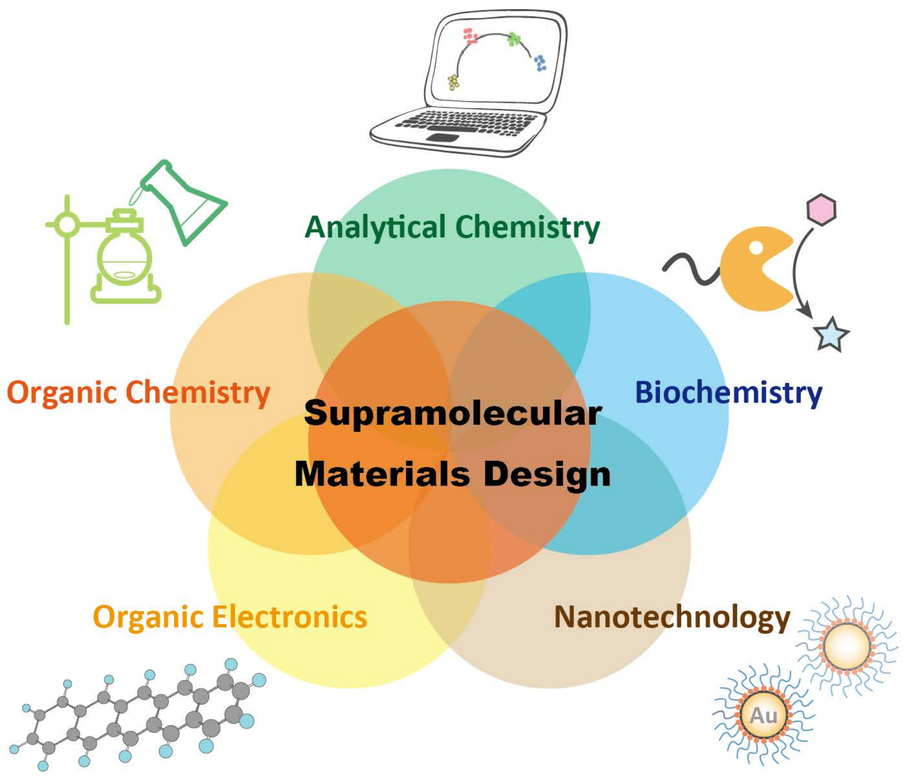
Department of Advanced Interdisciplinary Studies

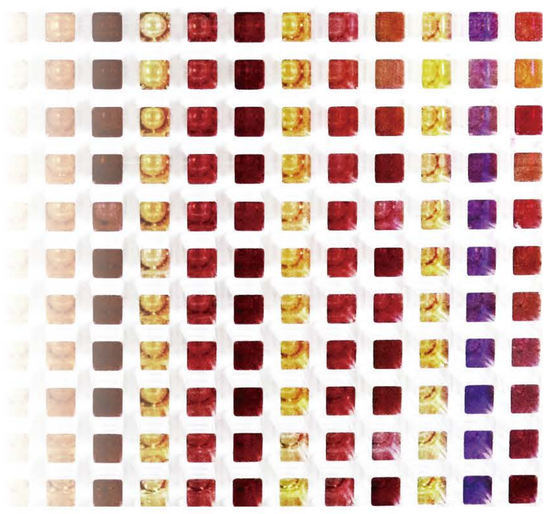
http://www.tminami.iis.u-tokyo.ac.jp/en/

”Visualization” of Molecular Functions



Organic Transistor-based Chemical Sensor



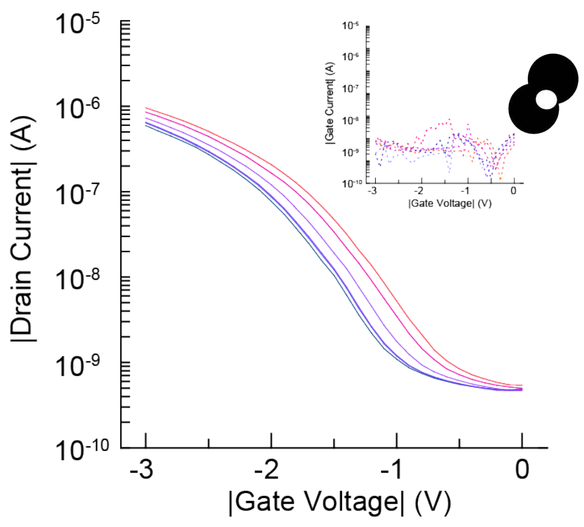


Chemosensor Array

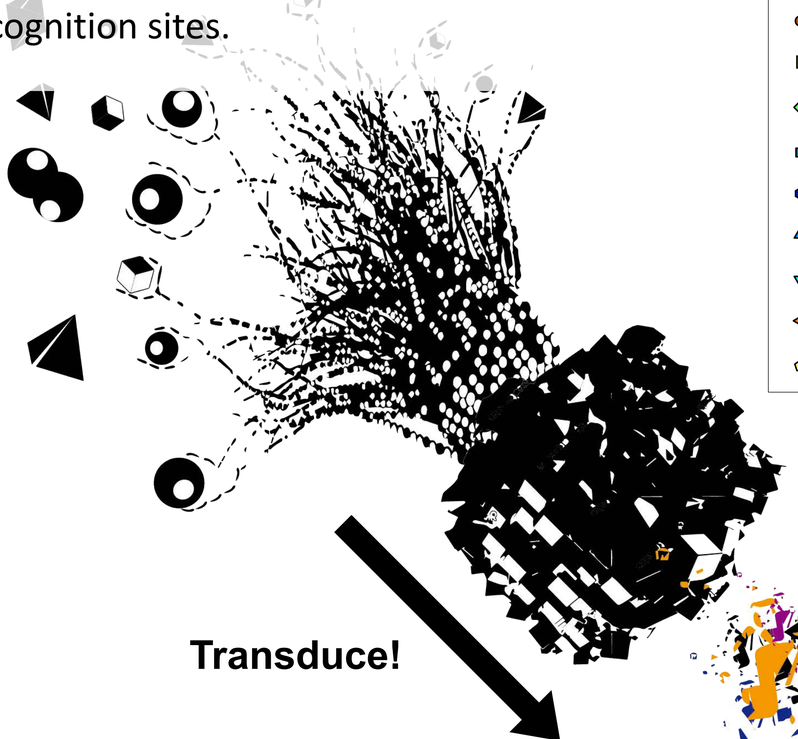
Our group is interested in “applied” supramolecular chemistry. While previous work in the field of supramolecular chemistry centered mostly on fundamental research, current developments suggest such chemistry to be well poised to make significant contributions to various research fields. Especially, supramolecular sensors for biologically important species or pollutants are some of the most promising applications of molecular recognition materials. To be harnessed for rigorous analytical assignments, our research centers on molecular design and synthesis of materials as well as fabrication of devices.

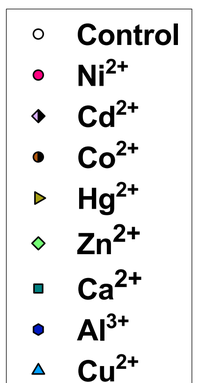
Construction of Molecular Recognition Sites for Target Analytes

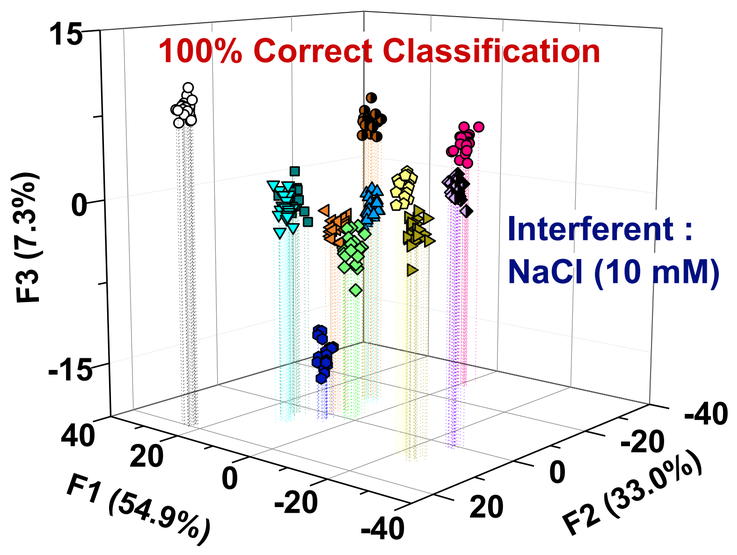
To capture target analytes in aqueous media, we design and synthesize novel artificial receptors and molecular recognition sites.



Ex. : Electrical Detection of monosaccharides using an organic transistor.







Ex. : Molecular self-assembled colorimetric chemosensor array for simultaneous detection of metal ions

Transducers for Information of Molecular Recognition

In the realm of electronics, organic thin-film transistors (OTFTs) are some of the most interesting devices owing to their flexibility, solution-processability and ultra-small thickness. In that regard, we are developing OTFT-based chemical sensors functionalized with artificial receptors.

Multi-analyte Detection Methods

Our attention is being devoted to the development of supramolecular sensor arrays, owing to their capability to recognize a number of analytes with high classification accuracy. With that in mind, we especially focus on simultaneous analysis of multi-analytes in biological fluids or environmental water.