Laboratory for Green Porous Materials

General Information

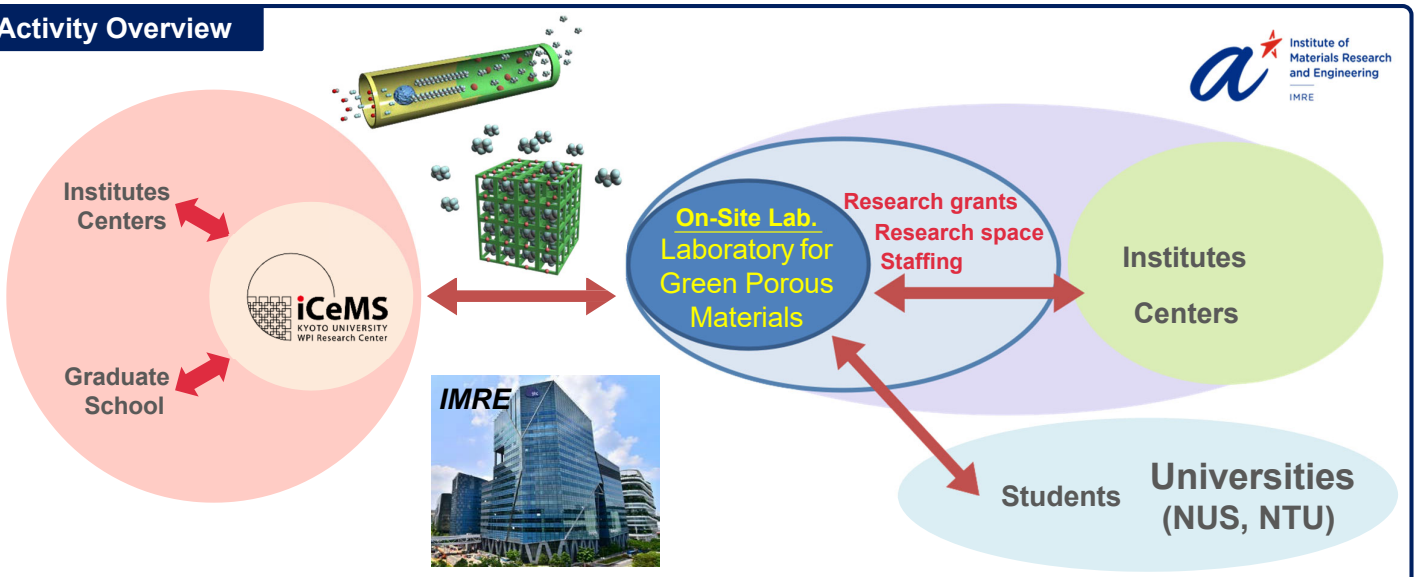
- Approved in FY 2020
- Established in FY 2020
- Established by the Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University Institute for Advanced Study (KUIAS)
- Partner institution: The Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology and Research (A*STAR), Singapore
- Location: IMRE, Singapore (outbound)
- Functions:
  - Research on environmental catalysis using porous materials, development of new fields of study that contribute to the environment, and promotion of cutting-edge interdisciplinary research.
  - Development of hybrid materials consisting of porous materials and biocompatible polymers for medical and healthcare applications.

Positive ripple effects to the university's activities

- Serves as Kyoto University's point of contact at A*Star in Singapore.
- Acts as a bridge between Kyoto University and Singaporean universities and research institutes in material science research.
- Kyoto University early-career researchers and students are motivated by international students.
- Helps Kyoto university students develop international awareness.

- Expansion and development of joint research topics between KUIAS and IMRE.
- Research guidance for talented students at the National University of Singapore, etc.
- Exchange between Kyoto University researchers and local researchers and students through holding seminars.
- Exploring the potential of porous materials development in cooperation with local companies.

Activity Overview



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Main activities in FY 2023

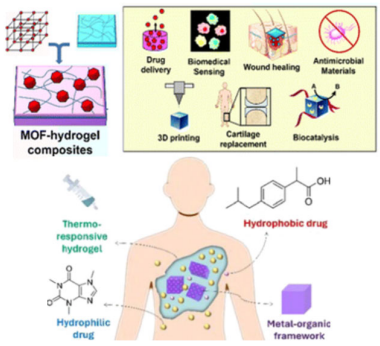
❶ Research on design and synthesis of green porous materials

1. In 2023, we mainly conducted online meetings for the following research topics because researchers were unable to freely travel between Kyoto and Singapore due to the COVID-19 pandemic and its after-effect.
   - Theme 1: MOF catalysts for sustainable applications
   - Theme 2: MOF-mixed matrix membranes
   - Theme 3: MOF defect engineering
   - Theme 4: MOF/Biocompatible polymer hybrids
2. The researchers listed on the right engaged in research on synthesis of green porous materials. Prof. Susumu Kitagawa and Asst. Prof. Kenichi Otake of iCeMS developed the measurement equipments, and evaluated the structures and properties of the materials. They co-wrote and published papers based on the results of the collaborative research on Theme 4.
   (1) "Biomedically-relevant Metal Organic Framework-Hydrogel Composites", Jason Y. C. Lim , Leonard Goh , Ken-ichi Otake , Shermin S Goh , Xian Jun Loh and Susumu Kitagawa,
   Biomaterial Sciences, **11**, 2661-2677, 2023
   (2) "MOF-Thermogel Composites for Differentiated and Sustained Dual Drug Delivery" Xin Li, Tristan Tan, Qianyu Lin, Chen Chuan Lim, Rubayn Goh, Ken-ichi Otake, Susumu Kitagawa, Xian Jun Loh, Jason Lim,
   ACS Biomaterials Science & Engineering, **9**, 5724-5736, 2023

Research collaboration with the IMRE / Soft Materials Laboratory
(PI: Prof. Loh Xian Jun, director of IMRE)

Onsite laboratory researchers (concurrent posts)

Assistant Professor Jason Lim
Dr. Shermin Goh
Dr. Tristan Tan



❷ Mutual Research Visit

- Distinguished Prof. Susumu Kitagawa of iCeMS stayed at the Onsite Lab from July 30th to August 1st for discussion and research exchanges.
- Asst Prof. Jason Lim, a member of the Onsite Lab, stayed at iCeMS as a visiting researcher from February 28th to March 2nd for research exchanges.
- The opening ceremony of the on-site lab and the Scientific Seminar, which had been postponed due to the COVID-19 pandemic, were held at IMRE on March 11th. Ten Kyoto University staff members, including Kitagawa and Otake, visited IMRE for research exchange