List of the laboratories available with the research project samples for the Chemistry Undergraduate Program at the 4th year, Dept. of Engineering, and for the Chemistry Graduate Program (Ms, PhD), Dept. of Materials Chemistry*, Graduate School of Engineering

G30 Chemistry Program at Department of Chemistry and Biotechnology is managed by the cooperation of the following 3 departments:

- *Molecular & Macromolecular Chemistry*
- *Materials Chemistry*
- *Biomolecular Engineering*

*Note: Graduate students under G30 Chem-Eng Program will be nominally enrolled in "Materials Chemistry". However, undergraduate G30 Chem-Eng students can belong to all research groups in the following three departments: the Department of Molecular and Macromolecular Chemistry, the Department of Materials Chemistry, and the Department of Biomolecular Engineering.

Department of Molecular and Macromolecular Chemistry

Organic Material Chemistry (Shinokubo Group): Prof. Shinokubo (hshino[at]chembio.nagoya-u.ac.jp)

- Synthesis of Novel Porphyrin Analogues
- Synthesis of New Functional π-Systems

Organoelement Chemistry (Yamashita Group): Prof. Yamashita (makoto[at]oec.chembio.nagoya-u.ac.jp)

- Creation of New Chemical Bonds and New Structural Motif Involving Main Group Element
- Synthesis of New Transition Metal Catalysts for Bulk Processes

Organic Reactions (Ooi Group): Prof. Ooi (tooi[at]chembio.nagoya-u.ac.jp)

- Design of Molecular Catalysts for Development of Selective Organic Transformations and Mechanistic Elucidation
- Development of Small Organic Molecules for Understanding and Controlling Biological Systems

Catalysis in Organic Synthesis (Ishihara Group): Prof. Ishihara (ishihara[at]cc.nagoya-u.ac.jp)

- Design of tailor-made conformationally flexible chiral supramolecular catalysts beyond enzymes
- **Redox organocatalysis: Design of environmentally benign halogen catalysts without transition metals**

Organic Chemistry of Macromolecules (Kamigaito Group): Prof. Kamigaito (kamigait[at]chembio.nagoya-u.ac.jp)

- Living Cationic Polymerization via Reversible Addition-Fragmentation Chain Transfer Mechanism
- Controlled Radical Polymerization of Pinocarvone Derived from Naturally-Occurring α-Pinene

Supramolecular Polymer Chemistry (Yashima Group): Prof. Yashima (yashima[at]chembio.nagoya-u.ac.jp)

- Synthesis and Application of Helical Molecules, Supramolecules, and Polymers
- Synthesis of Helical Polymers with Helicity Memory Showing Chiral Recognition and Asymmetric Catalysis

Molecular Structures and Structural Dynamics (Shin Group): Prof. Shin (jyshin[at]chembio.nagoya-u.ac.jp)

- Electronic and Magnetic Properties of Organic Compounds and Metal-Organic Complexes.
- Exploration of Novel Functional Molecules Created with Polypyrrolyl Oligomers

Department of Materials Chemistry

Catalyst Design (Satsuma Group): Prof. Satsuma (satsuma[at]chembio.nagoya-u.ac.jp)

- Development of solid catalysts for clean automotive exhaust, methane selective oxidation, and hydrogen storage-Reaction mechanism of solid catalysts studied by in-situ spectroscopies and theoretical calculations

Material Design Chemistry (Torimoto Group) : Prof. Torimoto (torimoto[at]chembio.nagoya-u.ac.jp)

- Development of Novel Metal Alloy Nanoparticles for Next Generation Fuel Cells
- Preparation of Multinary Semiconductor Quantum Dots for Exploring Novel Photoluminesence Materials

Structural and Functional Chemistry (Matsuda Group) : Prof. Matsuda (ryotaro.matsuda[at]chembio.nagoya-u.ac.jp)

- Nanospace Design of Metal Organic Frameworks
- Development of Energy Related Materials Based on Molecular Adsorption

Functional Materials Chemistry (Ohtsuki Group) : Prof. Ohtsuki (ohtsuki[at]chembio.nagoya-u.ac.jp)

- Development of Inorganic-Organic Hybrid Nanomaterials for Biomaterials Application
- **Computational chemistry for the analysis and development of novel functional materials.**

Porous Materials Chemistry (Nakanishi Group) : Prof. Nakanishi (dknakanishi[at]imass.nagoya-u.ac.jp)

- Liquid-phase synthesis of hierarchically porous materials and their application to analytical science
- Low-density solids with organic-organic hybrid compositions for super thermal insulation

Functional Materials Engineering (Osada Group) : Prof. Osada (mosada[at]imass.nagoya-u.ac.jp)

- Exploration of novel functional materials based on 2D oxide nanosheets
- Controlled assembly of 2D oxide nanosheets and their applications to electronic materials

Department of Biomolecular Engineering

Nanobio Analytical Chemistry, Biomolecular Chemistry (Baba Group) : Prof. Baba (babaymtt[at]chembio.nagoya-u.ac.jp)

- Ultrafast Analysis of DNA and RNA by Nanodevices
- Quantum Dot Imaging of Stem Cell for Stem Cell Therapy

Chemical Biotechnology (Murakami Group) : Prof. Murakami (murah[at]chembio.nagoya-u.ac.jp)

- *In Vitro* Selection of Functional Biomolecules
- Chemical Protein Synthesis

Supramolecular Biochemistry (Asanuma Group) : Prof. Asanuma (asanuma[at]chembio.nagoya-u.ac.jp)

- Design of acyclic artificial nucleic acid (XNA) for biotechnology
- Functional reinstallation of DNA with base-surrogates

Chemical Genetics (Kiyonaka Group) : Prof. Kiyonaka (kiyonaka[at]chembio.nagoya-u.ac.jp)

- Chemical Biology for neurotransmitter receptors
- Development of new chemical genetics tools

Biochemical Engineering (Honda Group) : Prof. Honda (honda[at]chembio.nagoya-u.ac.jp)

- Screening of novel functional peptides using peptide array
- Cells/tissues/organs on chips using BioMEMS

Environmental Biotechnology (Hori Group) : Prof. Hori (khori[at]chembio.nagoya-u.ac.jp)

- Molecular mechanism of bacterial adhesion to solid surfaces
- Application of adhesive bacterionanofibers for microbial immobilization

Note

1. *Change [at] to @ when you e-mail these professors.*
2. *If you need further information, please confirm the following website:*
   http://www.chembio.nagoya-u.ac.jp