

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 (M, D), 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

*Note: Students under G30 Graduate Program will be nominally enrolled in "Materials Chemistry", but can belong to labs in either "Molecular & Macromolecular Chemistry" or "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: hypervalent iodine-catalyzed oxidative coupling reactions

Physical Chemistry of Polymers (Matsushita Group): Prof. Matsushita (yushu[at]chembio.nagoya-u.ac.jp)

- Preparation and Morphology of Nanohybrids Composed of a Block Copolymer and Semiconductor Nanoparticles
- Effects of Composition Distribution on Microphase-Separated Structures from Triblock Terpolymers

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 Double-Stranded Helical Molecules
- Synthesis of Helical Polymers with Asymmetric Catalytic Activity

Macromolecular Assembly Systems (Seki Group): Prof. Seki (tseki[at]chembio.nagoya-u.ac.jp)

- Photoalignment Control of Nanodomains in Liquid Crystalline Block Copolymer Thin Films
- Formation of Vertically Aligned Lamellae in Thin Films of Block Copolymer-Silica Hybrid Material

Department of Materials Chemistry

Theoretical and Computational Chemistry (Okazaki Group): Prof. Okazaki (okazaki[at]chembio.nagoya-u.ac.jp)

- Molecular aspects of surface tension of spherical micelles based upon molecular dynamics calculations
- Lateral free energy profile of lipid molecules in the membranes studied by molecular dynamics calculations

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

- Development of solid catalysts for clean automotive exhaust, biomass conversion, and fuel cell electrode
- 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 Photoluminescence 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 Crystalline Chemistry (Ohtsuki Group) : Prof. Ohtsuki (ohtsuki[at]chembio.nagoya-u.ac.jp)

- Protein adsorption on hydroxyapatite synthesized through hydrothermal processing
- Hydroxyapatite coating on magnetite particles through biomimetic processing

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

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

- Genetic Code Engineering
- Construction of Large Genomic DNA

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

- Photoregulation of DNA/RNA supramolecular functions by azobenzene-tethered oligonucleotides
- Development of super-sensitive fluorescent probes and their applications to m-RNA imaging in cell

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 (khoru[at]chembio.nagoya-u.ac.jp)

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

Structural Biotechnology (Watanabe Group) : Prof. Watanabe (nobuhisa[at]chembio.nagoya-u.ac.jp)

- Structural biology of piezophiles using high-pressure protein crystallography and its application to the creation of pressure tolerant enzymes
- Structural study of macromolecular solutions using small-angle X-ray scattering and its application

Note

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