

Division of Material Chemistry	Research field	Biochemistry	Lab. ID MC05
Laboratory web site	http://biochem.web.fc2.com/index.html		
Research subjects			
<p>Among conversion processes of biomolecules, metabolism, by proteins, redox processes are particularly sophisticated and attractive due to complexity and difficulty to explore. We have studied structure–function relationships of complex enzymes, which require transition metal ions such as copper and iron or organic cofactors for basic biochemistry and applications. Target proteins are involved in the central fields of life, energy conversion, detoxification, synthesis, degradation etc. We also have interests in protein engineering to enhance enzymatic activities and to alter specificities and also to applying our enzymes to biofuel cells and biosensors. Key words: Metalloprotein, Energy Conversion, Conversions of Small Molecules, Protein Engineering, Electrode Catalyst, Structure Analysis, Photosynthetic Bacteria, Electron Transfer, Proton Transport.</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>In addition to the lecture (seminars) about biochemistry to all graduate students (both Master and Doctoral Courses) we have seminars to carefully read review articles or books written in English and to show novel papers in which we are deeply concerned and are specially interested. All graduate students are required to actively participate in seminars to give timely questions and to discuss. The student to give a presentation is required to prepare a resume easily understandable and power point files to skill up his or her presentation ability. All graduate students should represent his or her research study at least once in the international or domestic meetings.</p>			
Daily life in the laboratory, etc.			
<p>I make it a rule to have my lunch together with my students for keep in touch with them (staff). We are doing research hard and also enjoying laboratory life (Student). All we laboratory members are friendly and assist each other even when reached a plateau (Student).</p>			
Message or comments by the laboratory faculty staffs			
<p>Students should keep paying attention what is going on, or anything unusual might happen, even in ordinary experiments in your laboratory. Only person to keep in mind, what should be done now or in future, whether everything what should be done is really done, are celebrated with success. What is now popular is already old! Look for research themes of high values for humanity in the future..</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2017.3	Heterologous expression and characterization of a laccase from obligate anaerobe <i>Clostridium beijerinckii</i>		
2017.3	Random and direct mutagenesis to enhance catalytic activity of the multicopper oxidase, CueO		
2016.3	Structure–function relationships of the loops forming the substrate–binding site of bilirubin oxidase		
2016.3	Functional studies on the proteins concerned in the denitrification process of <i>Halomonas halodenitrificans</i>		
2015.3	Studies on the Four–electron Reduction of Dioxygen by the Mutations at the Outer–sphere of the Trinuclear Copper Center in a Multicopper Oxidase, CueO		
2014.3	Protein Engineering of a Metal Oxidase from a Microorganism		
2014.3	Mutations at around the Type I Copper Center in Bilirubin Oxidase and its Surface		
2014.3	Redox Properties of the Cytochrome <i>cd</i> Type Nitrite Reductase from a Moderately Halophilic Denitrifier <i>Halomonas halodenitrificans</i>		
2013.3	A Heterologous Expression of a Laccase Involved in the Formation of Insect Cuticle		
2013.3	Mutations at and at around the Four–electron Reduction Site of $\Delta\alpha5-7$ CueO		
2013.3	Mutations at the Trinuclear Copper Center in Bilirubin Oxidase		
2013.3	Heterologous Expression and Characterizations of a Novel Multicopper Oxidase		
Recent Doctoral theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2015.9	Studies on the Pirin–Like Protein from <i>Pseudomonas stutzeri</i> Zobell: Gene Cloning, Heterologous Expression, and Its Quercetinase Activity.		
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