

# マルチ銅オキシダーゼにおける三核銅クラスター

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# 1996 Fiscal Year Final Research Report Summary

## THE TRINUCLEAR COPPER CLUSTER IN MULTICOPPER OXIDASES

Research Project

### Project/Area Number

07640740

### Research Category

Grant-in-Aid for Scientific Research (C)

### Allocation Type

Single-year Grants

### Section

一般

### Research Field

Inorganic chemistry

### Research Institution

(INSTITUTE FOR MOLECULAR SCIENCE) Okazaki National Research Institutes (1996)  
Kanazawa University (1995)

### Principal Investigator

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### Project Period (FY)

1995 - 1996

### Keywords

MULTICOPPER OXIDASE / ASCORBATE OXIDASE / LACCASE / TRINUCLEAR CENTER / ESR / SQUID / ANTIFERROMAGNETIC INTERACTION

### Research Abstract

EPR SPECTRA OF LACCASE AND ASCORBATE OXIDASE WERE MEASURED FROM 3 K TO 300 K AND WERE SIMULATED,SHOWING THAT THE STRUCTURE OF TYPE 2 COPPER CHANGES FROM TETRAGONAL AT LOW TEMPERATURE TO TETRAHEDRAL AT HIGH TEMPERATURE BECAUSE OF THE PROTEIN CONFORMATION CHANGE.SQUID WAS ALSO MEASURED FROM 5 K TO 300 K AND THE - 2J VALUE OF THE ANTIFERROMAGNETIC INTERACTION BETWEEN TYPE 3 COPPERS WERE DETERMINED AND WAS FOUND THAT THE TRIPLET STATE IS NOT NEGLIGIBLE AT ROOM

TEMPERATURE IN THE CASE OF ASCORBATE OXIDASE.THE CAREFUL INSPECTION OF SQUID,ESR SPECTRA AND RESONANCE RAMAN SPECTRA OF THE INCREASING AMOUNT OF AZIDE ACTION ON LACCASE INDICATED THAT AZIDE IS BOUND TO ONE OF TYPE 3 COPPERS WITH THE END-ON FASHION BY WEAKENING THE INTERACTION IN THE TRINUCLEAR CENTER AND FINALLY BREAKING THE INTERACTION BY EXPELLING THE BRIDGING HYDROXIDE FROM COORDINATION SPHERE.

## Research Products (12 results)

All Other

All Publications (12 results)

- [Publications] 櫻井武 他1名: "Direct Electrochemistry of Blue Copper Proteins at Au Electrodes Modified with Promoters" Chemistry Letters. 1995 · 8. 1075-1076 ▼
- [Publications] 櫻井武 他1名: "Room temperature ESR Spectra of Rhus vernicifera Laccase and Derivatives" Biochemical and Biophysical Research Communications. 215 · 1. 235-240 ▼
- [Publications] 櫻井武 他1名: "EPR Spectra of Type 3 Copper Centers in Rhus vernicifera Laccase and Cucumis sativus Ascorbate Oxidase" Biochimica et Biophysica Acta. 1248 · 2. 143-148 ▼
- [Publications] 櫻井武: "Cyclic Voltammetry of Cucumber Ascorbate Oxidase" Chemistry Letters. 1996 · 4. 481-482 ▼
- [Publications] 櫻井武 他2名: "FT-IR Spectra of the Azide-Type 3 Copper in Laccase and Ascorbate Oxidase" Chemistry Letters. 1996 · 6. 651-652 ▼
- [Publications] 櫻井武 他3名: "Reduction and Oxidation Processes of Blue Copper Proteins,Azurin,Pseudoazurin,Umecyanin,Stellacyanin,Plantacyanin,and Plastocyanin Approached by Cyclic and Potential Step Voltammtries" Bulletin of the Chemical Society of Japan. 69 · 10. 2855-2862 ▼
- [Publications] TAKESHI SAKURAI: "DIRECT ELECTROCHEMISTRY OF BLUE COPPER PROTEINS AT AU ELECTRODES MODIFIED WITH PROMOTERS" CHEM.LETT.1075-1076 (1995) ▼
- [Publications] TAKESHI SAKURAI: "ROOM TEMPERATURE ESR SPECTRA OF RHUS VERNICIFERA LACCASE AND DERIVATIVES" BIOCHEM.BIOPHYS.RES.COMMUN.215. 235-240 (1995) ▼
- [Publications] TAKESHI SAKURAI: "EPR SPECTRA OF TYPE 3 COPPER CENTERS IN RHUS VERNICIFERA LACCASE AND CUCUMIS SATIVUS ASCORBATE OXIDASE" BIOCHIM.BIOPHYS.ACTA. 1248. 143-148 (1995) ▼
- [Publications] TAKESHI SAKURAI: "CYCLIC VOLTAMMETRY OF CUCUMBER ASCORBATE OXIDASE" CHEM.LETT.481-482 (1996) ▼
- [Publications] TAKESHI SAKURAI: "FT-IR SPECTRA OF THE AZIDE TYPE 3 COPPER IN LACCASE AND ASCORBATE OXIDASE" CHEM.LETT.651-652 (1996) ▼
- [Publications] TAKESHI SAKURAI: "REDUCTION AND OXIDATION PROCESS OF BLUE COPPER PROTEINS,AZURIN,PSEUDOAZURIN,UMECYANIN,STELLACYANIN,PLANTACYANIN,AND PLASTOCYANIN APPROACHED BY CYCLIC AND POTENTIAL STEP" BULL.CHEM.SCC.JPN.2855-2862 (1996) ▼

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